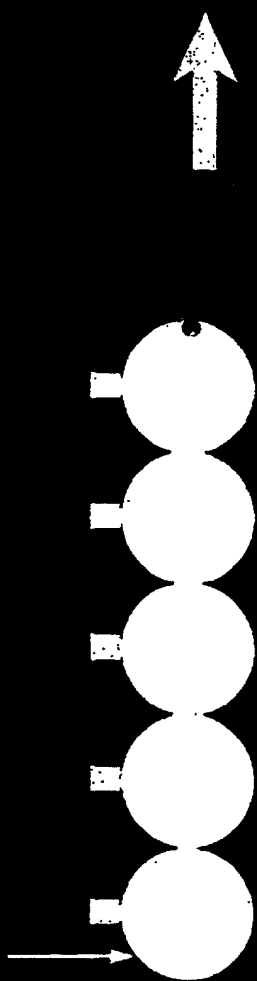
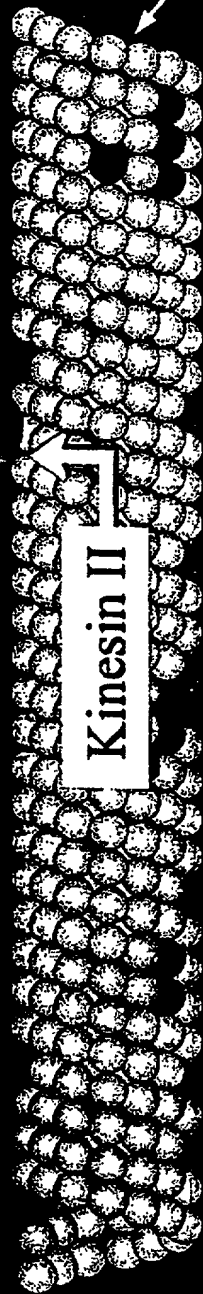


IFT Particle



Kinesin II

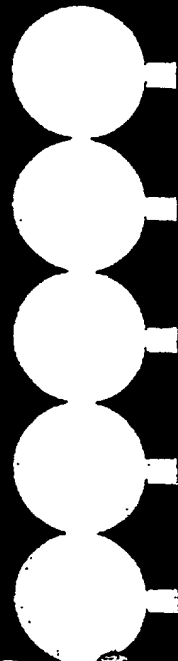
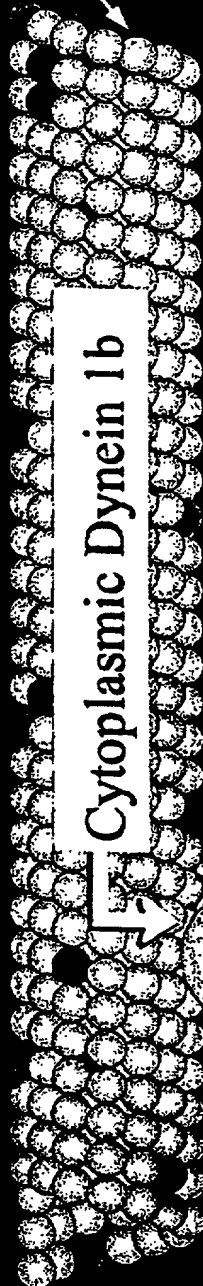


(-)

B-Sub fiber
of outer
doublet
microtubule

(+)

Cytoplasmic Dynein 1b



"RAFT"

Flagellar Membrane

FIG. 1

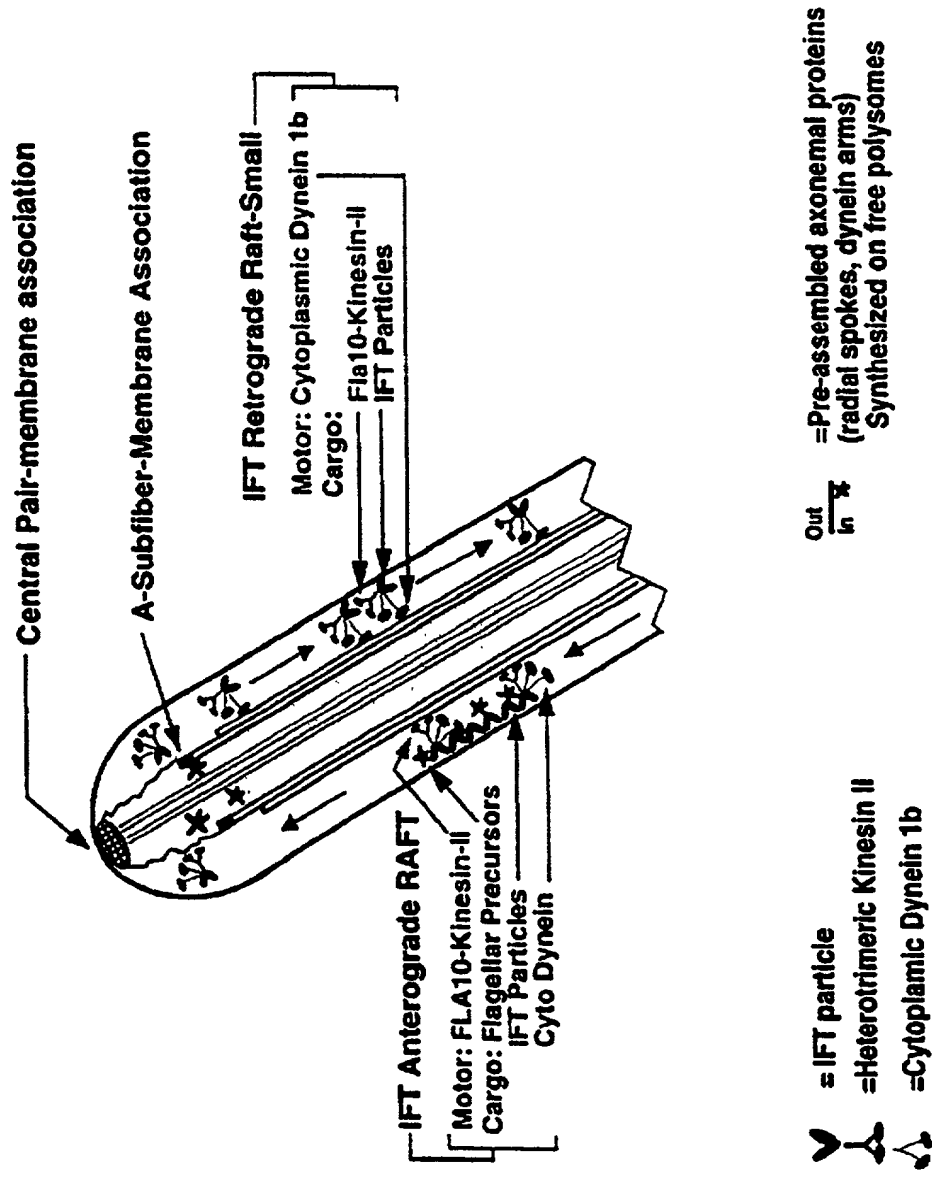


FIG. 2

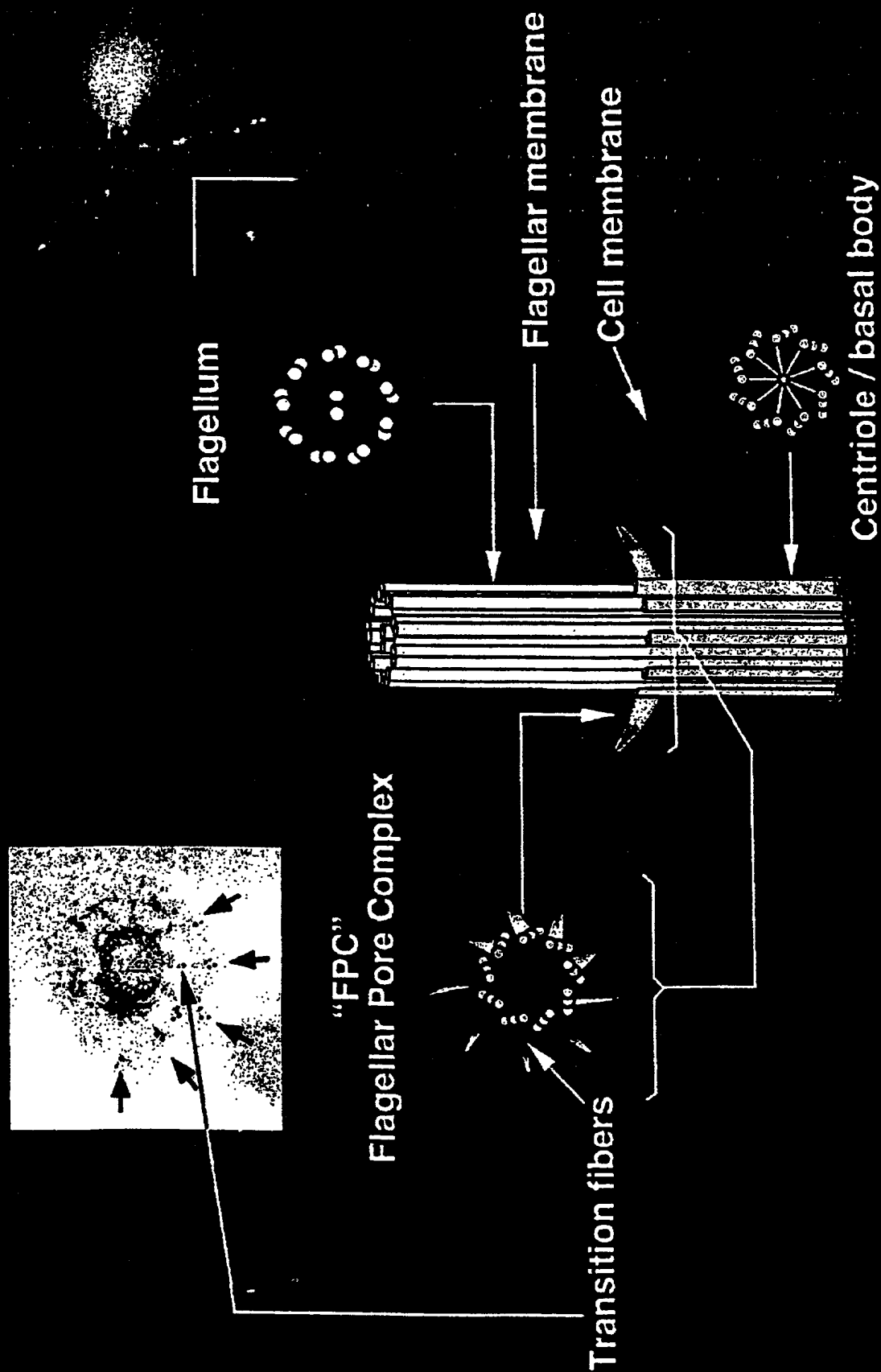


FIG. 3

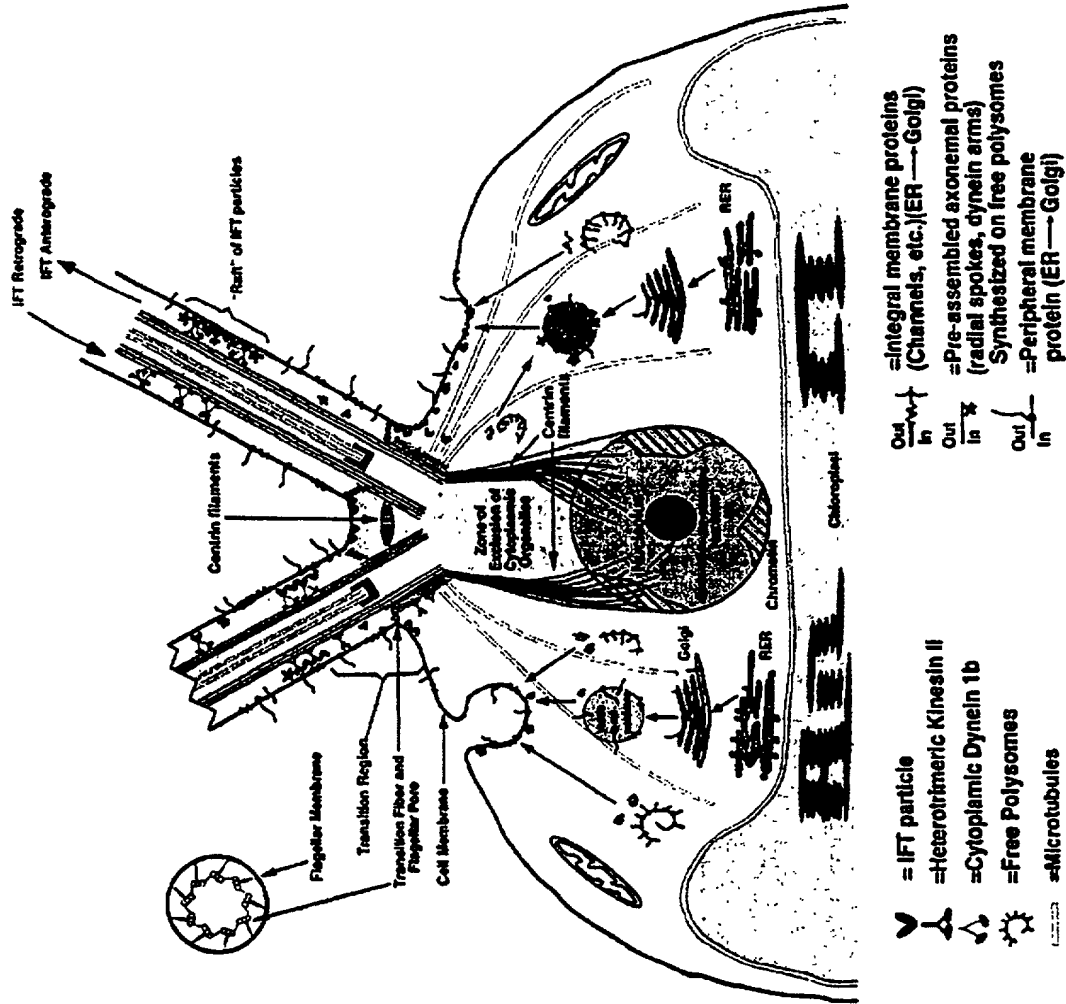


FIG. 4

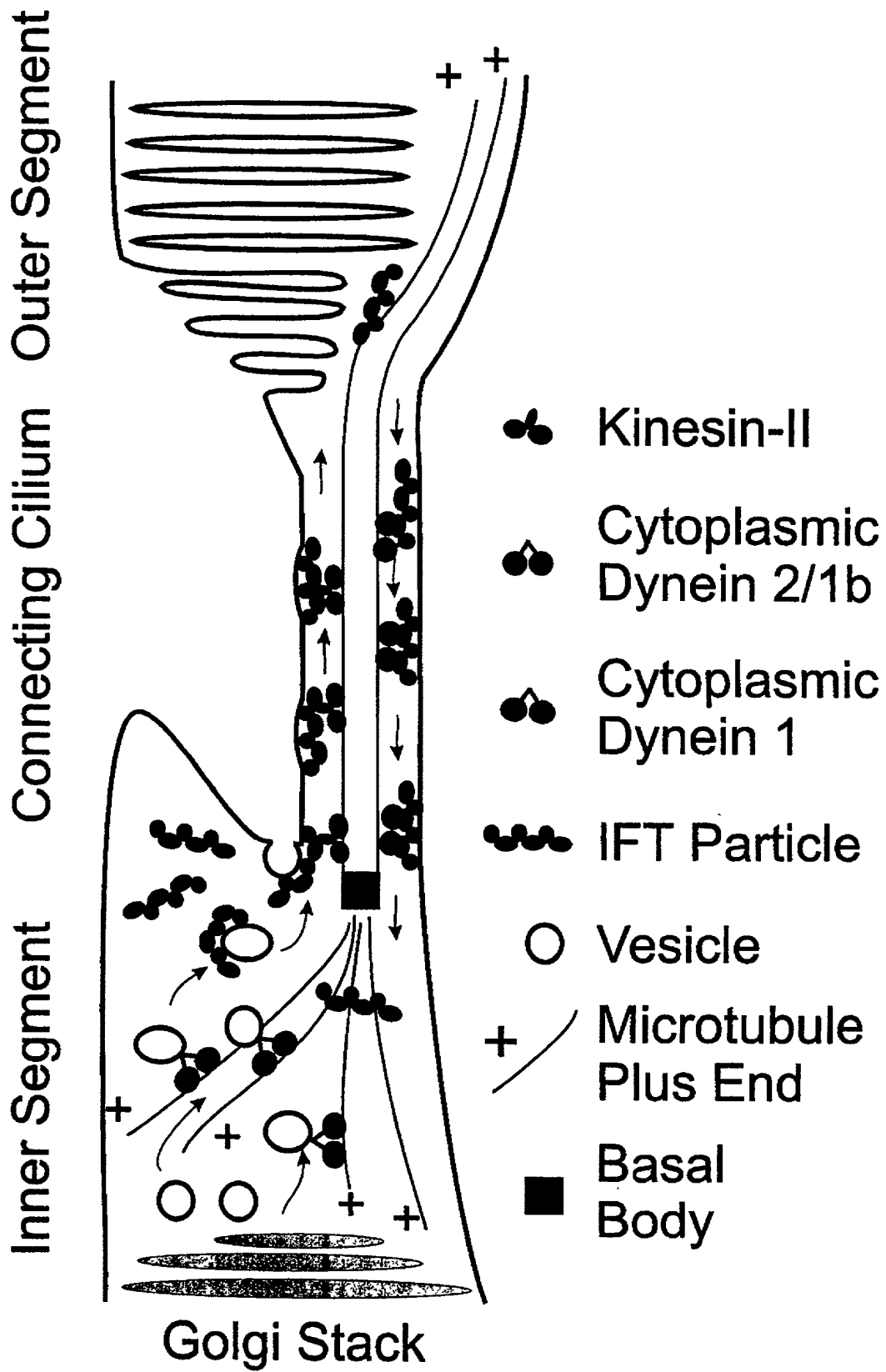


FIG. 5

IFT20

Chlamydomonas

>Cr_IFT20 predicted peptide

MDAVDRGVYFDEDFHVRILDVDKYNASKSLQDNTNVFINNIQNMQGLVDKYVSAIDQQVERLEA
EKLKAIGLRNRVAALSEERKRKQKEQERMLAEKQEELERLQMEEQSLIKVKGEQELMIQKLSDDS
SGAAYV (SEQ ID NO: 2)

FIG. 6A

>Cr_IFT20 cDNA

CACCGCTGCCGCTGAACAGAAAGTCTGCGCAGACTCGTCTTCTTGCCAAGTTCTTGCCAAAAC
CAGCAGGCCTAGAGGTTGCCTTAACCTAAATATACAAAACACAGAGCATCATGGACGCGGTA
GATAGAGGAGTCTACTTTGACGAGGACTTTTCATGTCCGCATTCTTGATGTTGACAAGTACAAT
GCTTCAAAGTCGCTCCAGGACAACACAAATGTGTTCATTAACAACATCCAAAATATGCAAGGC
CTCGTGGACAAGTACGTGTCCGCCATCGACCAGCAGGTCGAGCGGCTAGAAGCTGAAAAGCT
GAAGGCCATTGGCCTGCGGAACCGGGTGGCTGCGCTGAGCGAGGAGCGGAAACGTAAACAA
AAGGAGCAGGAGCGCATGCTAGCGGAGAAGCAGGAGGAGCTTGAGAGGCTCCAAATGGAGG
AGCAGTCGCTGATCAAGGTGAAGGGCGAGCAGGAGCTCATGATTCAGAAGCTGTCGGACAGC
AGCAGCGGGGCGGCATACGTGTAAACGGTGTTTCGGACGTCATGCGTGCAAAGGTAGTTTGCT
CTGTGAGGGTTGGCTGAGGCGGCGGAGGCTGCTATTGAGGCTGCAGCATGCGGTCTGGTGGC
AGATGTACATAACGGTATGGGGTGTGGCGACAGAACGAAACGGCGAGGGTGCGCAAATGTC
GTGCAGAAGCGACGCTACAGCATCCATGGTACGTAGAGGCTTACTGGGTGTCAGTGCCTGCTC
CGCCACTGGGGACACACTTGCAGCGAGGAGCGCCATTGTTTGGCCACGGATTGCGTCAAGG
ACTTGAACGGCGCCAGTGAAGGCGGGGAATGGAATGTAAACAAACGACTCGAAAAAAAAA
AAAAAAAAA (SEQ ID NO: 1)

FIG. 6B

Human

>Hs_IFT20-1 chr17 gb|AC002094.1|AC002094 [expressed]

MAKDILGEAGLHFDELNKLRLVDPEVTQQTIELKEECKDFVDKIGQFQKIVGGLIELVDQ
LAKEAENEKMKAI GARNLLKSI AKQREAAQQQLALIAEKKMQLERYRVEYEALCKVEAE
QNEFIDQFIFQK (SEQ ID NO: 23)

FIG. 6C

> Hs_IFT20-2 EST gb|AA584846.1|AA584846

QDSLGEAGLCFDELSKVRDPEVT*QTRDPKEDCMD FVGKISPFQKEIVGGLIEPVDQLAKAAENEK
RKVVGAWNLLQFMAKHREAAQQQLLAQTAEKMWLKRWWIEYE (SEQ ID NO: 24)

FIG. 6D

>Hs_IFT20-3 chr14 emb|AL121808.2|CNS01DSJ Human chromosome 14

MVKDILAEGLHFDELNKLWVLDSEVTQQTTELKEECKNFADKTGQFQKTVGGLIELVDK
LAKKA*NAKMRAMVLR (SEQ ID NO: 25)

FIG. 6E

IFT27

Chlamydomonas

>Cr_IFT27 predicted peptide

MVKKEVKPIDITATLRCKVAVVGEATVGKSALISMFTSKGSKFLKDYAMTSG
VEVVVAPVTIPDTTVSVELFLDLAGSDLYKEISQYWNGVYYAILVFDVSSMESFESCK
AWFELLKSARPDRERPLRAVLVANKTDLPQRHQVRLDMAQDWATTNTLDFFDVSNPPG
KDADAPFLSIATTFYRNYEDKVAAFQDACRNY (SEQ ID NO: 4)

FIG. 7A

>Cr_IFT27 cDNA sequence

ATGGTGAAGAAAGAAGTGAAGCCCATCGATATCACCGCAACGCTAAGATGCAAAGTAGCAGT
AGTCGGCGAAGCGACTGTCGGCAAGAGCGCGCTCATCTCTATGTTACGAGTAAAGGCAGCA
AGTTTCTAAAGGACTATGCGATGACGAGTGGGGTGGAGGTGGTGGTAGCCCCGGTGACCATT
CCGGACACGACGGTCTCGGTGGAGCTCTTTCTGCTGGACACGGCGGGGAGCGACCTGTACAA
GGAGCAGATATCGCAGTACTGGAACGGCGTATACTACGCCATTCTCGTGTTCGATGTGAGCTC
TATGGAGTCCTTCGAGTCGTGCAAGGCGTGGTTTGAGCTGCTCAAATCGGCGCGTCCCGACCG
CGAGCGGCCGCTGCGCGCCGTGCTGGTGGCGAACAAGACGGACCTTCCGCCGAGCGGCACC
AGGTGCGGCTGGACATGGCGCAGGACTGGGCCACCACCAACACCCTCGACTTCTTCGACGTGT
CCGCGAACCCGCCCGCAAGGACGCGGATGCGCCGTTCTGTCCATCGCCACCACCTTCTACC
GCAACTACGAGGACAAGGTGGCGGCCCTTCCAGGACGCTTGCCGCAACTACTGA

(SEQ ID NO: 3)

FIG. 7B

Human

>Hs_IFT27 gi|12653581|gb|AAH00566.1|AAH00566 putative GTP-binding protein

MVKLAAKCILAGDPAVGKTALAQIFRSDGAHFQKSYTLTTGMDLVVKTVVPVDTGDSVELFIFDS
AGKELFSEMLDKLWESPNVLCLVYDVTNEESFNNSKWLEKARSQAPGISLPGVLVGNKTDLAG
RRAVDSAEARAWALGQGLECFETSVKEMENFEAPFHCLAKQFHQLYREKVEVFRALA

(SEQ ID NO: 26)

FIG. 7C

IFT46

Chlamydomonas

>Cr_IFT46 predicted peptide sequence

MDDSMDYPDRDGDLDQFQGTARSQVVQNQPHDEEVNLSESESFAGADE
PPAAPRDASLIESHDMDEGPAAPARTLSPTGYEAGKHAPGGIANSDEAPPGAYNAQEYKH
LNVGEDVRELF SYIGRYKPQTVELDTRIKPFIPDYIPAVGGIDEFIKVPRPDTKPDYLGL
KVLDEPAAKQSDPTVLTQLRQLSKEAPGAKADMVGRLEHTDENKAKKIQQWIASINDIH
KAKPAATVNYSKRMPEIEALMQEWPPEVETFLKTMHMPSGDVELDIKTYARLVCTLLDIP
VYDDPVESLHVLFTLYLEFKNNPIFRQHMEMENKLDGMSGGGGGMMGGGADVGL

(SEQ ID NO: 6)

FIG. 8A

>Cr_IFT46 cDNA sequence

ATGGATGACTCTATGGACTACCCTGACCGCGACGGGGACGACCTGGACCAGTTCCAGGGCAC
CGCGCGCTCGCAGGTCGTGCAGAACAGCCGCACGACGAGGAGGTGAACCTGAGTGAGTCGG
AGAGCTTCGCGGGAGCGGATGAGCCTCCAGCTGCGCCTAGAGATGCGTCGCTCATAGAGTCA
CACGACATGGACGAGGGGCCAGCTGCTCCAGCGCGGACACTCTACCAACGGGCTATGAGGC
TGGAAGACACGCACCTGGCGGCATCGCCAACTCGGACGAGGCACCGCCGGGTGCTTACAACG
CACAGGAGTACAAGCACCTGAACGTGGGCGAGGACGTGCGCGAGCTGTTCTCCTACATCGGC
CGCTACAAGCCGCAGACGGTGGAGCTGGACACGCGCATCAAGCCCTTCATCCCTGACTACATC
CCCGCGGTGGGCGGCATCGACGAGTTCATCAAGGTGCCGCGACCCGACACCAAGCCCGACTA
CCTGGGGCTCAAGGTTCTGGACGAGCCGGCCGCCAAGCAGTCGGACCCACCGTGCTGACGC
TGCAGCTGCGGCAGCTGTCCAAGGAGGCGCCGGCGCCAAGGCCGACATGGTGGGGCGGCTG
GAGCACACCGACGAGAACAAGGCCAAGAAGATCCAGCAGTGATCGCCTCCATCAACGACAT
CCACAAGGCCAAGCCGGCCGCCACCGTCAACTACAGCAAGCGCATGCCAGAGATCGAGGCGC
TGATGCAGGAGTGGCCGCCGAGGTGGAGACCTTCCTCAAGACCATGCACATGCCGTCCGGC
GATGTGGAGCTGGACATCAAGACCTACGCCCGGCTGGTGTGCACGCTGCTGGACATTCCCGTG
TACGACGACCCCGTGGAGAGCCTGCACGTGCTGTTCACTGTACCTGGAGTTCAAGAACAAC
CCCATCTTCAGGCAGCACATGGAGATGGAGAACAAGCTGGACGGCATGTCTGGGCGGCGGCGG
CGGCATGATGGGCGGCGGCGCGGATGTGCTGGGCTTGTA

(SEQ ID NO: 5)

FIG. 8B

Human

>Hs_IFT46 gi|8926685|emb|CAB96537.1| hypothetical protein [Homo sapiens]

MADNSSDECEENNKEKKKTSQLTPQRGFSENEDDDDDDSDSDDDDEEHGAPLEGAY
DPADYEHLVPVSAIEKELFQYISRYTPQLIDLHKLKPFIPDFIPAVGDIDAFKLVPRPDGKPDNLGLL
VLDEPSTKQSDPTVLSLWLTENSKQHNTQHMVKVSLLEDAEKNPKAIDTWIESISELHRSKPPATV
HYTRPMPDIDTLMQEWSPEFEELLGKVS LPTAEIDCSLAEYIDMICAILDIPVYKSRIQSLHLLFSLYS
EFKNSQHFKALEGGKAFTPSSNSTSQAGDMETLTF

(SEQ ID NO: 27)

FIG. 8C

>*Chlamydomonas* cDNA sequence

CTAATGGCATGCAGTAAGGCACTGGTATAGAAACCGTTCCCACCGCCGCGCCCAGCCCCGCGT
CCTGTGAGCTGAGAGCTACTTAACAGCCATGGAGGAGCCGGGCGCGGAGGAGGTTTCGGATTCT
TCTTCAGCACAGCGAAGGGGGAATCCCATACGCACAAGGCAGGCTTCAAGCAGCTATTTCTGA
CGATTGCGTTCAACTTATCGTCCAGACAAAGTAGATAAAGGATGACTTCACGCTGGACACGCTG
CGGTCAGCGCACATCCTTGTGCTCGGTGGCCCGAAGGAGAAGTTACCGCGCCTGAGGTGGA
CATGCTCAAAAAGTTCGTGAAGAATGGTGGCTCCATCCTCATTCTAATGTCGGAGGGCGGCGA
GGAGAAGGCGGGCACTAACATCAACTACTTCCTCGAGCAGTTTGGCATGTCGGTGAACAACG
ACGCCGTGGTCCGCACCACGCACTACAAGTACCTGCACCCCAAGGAGGTGCTCATCTCGGACG
GCATCCTCAACCGGGCGGTGATCACGGGCGCGGGGAAGTCGCTGAACAGCAACGACGACGAC
GAGTTCCGCGTGTGCGGGGGCCGAGGCTTTTGATGGCACGGGCCTGGAGTACGTCTTCCCC
TTCGGTGCCACGCTCTCAGTGCAGAAAGCCCGCGGTGCCCGTCTTGTCAGCGGCAAAATCGCG
TACCCCATGAACCGGCCAGTGGGTGCGGTATGGGCGCAGCCCGGCTACGGCCGCATCGCCGT
GCTGGGCTCGTGCGCCATGTTTGACGACAAGTGGCTGGACAAGGAGGAGAAGTCCAAAATCA
TGGACTTCTTCTCAAGTTCCTCGAGCCGCATTCCAAAATCCAACGACATTGACGCGG
AGGAGCCGGACGTGAGCGACCTGAAGCTGCTGCCCCGACACAGCCAGTCTGGCAGACAAGCTG
AAGGGCTGCCTCCAGGAGATCGACGACGTGCCGCGCGACTGGACCTCGCTGTTGACGACTC
GCTGTTCAAGTTCGACACCGGCCTCATCCCTGAGGCCGTGTCGCTGTACGAGAAGCTGGGCGT
GAAGAAGGGGCAGCTGAACCTCATCCCGCCCTCCTTCGAGACGCCACTGCCGCGGCTGCAGCC
CGCCGTGTTCCCGCCCCACCATCCGTGAGCCGCCGCCGCGCGCTGGAGCTGTTGACCTGGA
TGAGAGCTTTGCCAGCGAGACGAACCGGCTGGCCTCGCTACCAACAAGTGCCACGGCGAGG
AGGACCTGGAGTACTACATCATGGAGGCGGGCCACATCCTGGGCCTCAAGCTGCAGGAGAAC
GCCAACGCCAAGCACGTGCTGTCGGAGGTGTTCCGCCGCATCGCGCAGTACAAGATGGGCAG
CCTGGGCCTGGGCCAGACGCTGGACTCCATGGGCCAGACCCTGCCCGCGGCCAACCAGTTCG
GCGACCAAGTTCGAGCTGTAAGGAGCAGCGAGCTACAGGCCGAGCAACTGCGTGGCAGGCGGC
AGGGCGGGCGCTGGCTGCGGCGGAGGCCGAGGCGGGGGCGGCTGGCCTGGGAATGCTGCTGG
CAGCGGATGTGGAACAGTGGGGCGCCGAGCTGCTGGAGCTGAGGCGGTTTCGGGGCTGGCTG
CTGGCGTGCTGGCAGCAGGATGTGCGCTTGTGCTGATGCGGTCAGCGGAGCAGCGGGCATGC
TGGGCTGCTGAACAGAGCCACGCGGGAGGGTGTGCGGCGCGCCAACGGCAGCAGCATGCTGC
ACGCGGGGTTGTGGCCTGGCGGCGAAAAGCTGGGCATTACCCGGTGCCTCCTCTGAAAGGCG
GCTGGGCTTGGCACCGCGTGTGCCGCTTGCGGTGTGCTGGGTGTAAGTGGTTTCACGCGTTCTCC
AGTCTGATGAGAGGAGCCTTTATCGGATTGACAATGGTCCATGGTGAACGATGGATTATGGAT
ATCGGAGTGCACAGAGGCTGACAAGATAACGTTACAGTCCAGGAGATATGTGGTGGTAGCTG
CAGCAACTACAAGATGGCGTCAGTCAGACCCGACCTGTTTTGAGTGCTGCAGGCTGACACGCA
TGCTGACAGAACAGACGCCGCTGCAATTGCGGTTGATATTTTAGCCAGAAGGCAATATGTGGG
TGTATGCGGGGGGTGGCATGAGGCGCGCGAGTGGAGGAGTACAGGGCTGCGTCGGGCGTGCG
CGTCTGCGGTTGCAACAGTGAGCTGTGTTGGGTGTGCAAGGTGGTGGGCGTGTGCATGGAGCC
GTGTGGAGCAGTGTTCCTGTCGCTCAAGCGGCCAGCATTCACTAAGCTCACGTGTAAAC
TCATTGCGGCTGAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

(SEQ ID NO: 7)

FIG. 9B

Human

>Hs_IFT52 gi|4929575|gb|AAD34048.1|AF151811_1 CGI-53 protein [Homo sapiens]
MEKELRSTILFNAYKKEIFTTNNGYKSMQKKLRSNWKIQSLKDEITSEKLNGVKLWITAGPREKFT
AAEFEILKKYLDTG GDVLV MLGEGGESRFD TNINFLLEEYGIMVNND AVVRNVYHKYFHPKEAL
VSSGVLNREISRAAGKAVLAIDEESSGNNALTFVYPFGATLSVMKPAVAVLSTGSVCFPLNRPI
LAFYHSKNQGGKLA VLGSCHMFSDQYLDKEENSKIMDVVVFQWLT TGDHILNQIDAEDPEISDY
MMLPYTATLSKR NRECLQESDEIPRDFTT LFDLSIFQLD TTSFHSVIEAHEQLNVKHEPLQLIQPQFE
TPLPTLQPAVFPPSFRELPPP LELFDLDETF SSEKARLAQITNKCTEEDLEFYVRKCGDILGVTSKLP
KDQQDAKHILEHVFFQVVEFKLNQEHDIDTSETAFQNNF (SEQ ID NO: 28)

FIG. 9C

Caenorhabditis elegans

>Ce_Osm-6 gi|2292823|emb|CAA03975.1|osm-6 [Caenorhabditis elegans]
MPPFSDEKMTNRSIGRKVLIDQSKQQQISLISGFRGVARHLKSVLTVEINTEPINLNGLEDVRMLIIP
QPKTSFGTGEIEAIWK FVEEGGSLMILSGEGGERQSLNEMIAKYGITV NKDSVIRTVFLKYFDPKEA
LVANGVINRAIAVA AAKKNVSTEQKHNSQALSFIYPYGCTLDVNNRMSNVVLSSGSTSFPTSRPVAA
FHETKLNEMKKKGRVCVVGSVSMFHDTYIDKEENGKIFDTFVEFLVNGLELNTIDAAEPEINDYTN
IPDHIHMSQQIKVCMYEGELDQAISDFMKIMDTSLHSFNLKHWPMTIRLYEALNLSPPPLTLVEPQ
FELPMPPFQPAVFPPTFQELPMPPLELFDLDEQFSSPEIQLSQLANRSEEDLIFFIEKAGEITGISAE
TRSERTPKKIHELAVSKLMLFKRSMMDGELEVASAFDIGEHDAHHQSFNQGEEMDEQLFSDIDEFD
DL (SEQ ID NO: 29)

FIG. 9D

IFT57

Chlamydomonas

>Cr_IFT57 predicted peptide sequence

MSSKRGGRSSLAKAPEEAVNGEAFAPESP PPPGDDGDAGGEDGGAPAPPPPPATKGGPVAVGRS
LEIQTPDVCMEMLADKLKLLNYEADFCKKKPYRKPLSRLYFAVPLANSSEQFFYFTSLATWLL
GLAGVELPAPKEFDDPNLTCQNILGAVKKLGFAPPSYHPTKLTVGNGKEVVGVLVDGLVDFVLERR
HHKYSRPAYGNDGQPEEGVQLDDEAEAAAMEGADELAMPAQNQADDDEEEEGVYVDPGRGDA
AGPGTGASAAMDAEKAVLVSKVDPTLWKIELERVAPKLRTIAADSKDWRSHLDEAHQHKEVISK
AWPDSKTSLERLRADLNGTLEKLQTREKFLNEQFESLMQQYRAARTTFTDVQETYNRKTEAVAD
RNQEMHRIGETLEEVKAMMDEKGSNIADATPVARIKTAIKQLNKELHDMEVRIGVVSHLTLQLSL
RNKRLLAQAALSDEEED (SEQ ID NO: 10)

FIG. 10A

>Cr_IFT57 cDNA sequence

GTCTTGGGAACCCAGCGAGCCGCGCTCCTTGCCACATGTCCTGCTAGCTTCTGGTTTACACCGT
AGATTCATTTAAGCGAGAGACATGAGCAGCAAGCGGGGTGGGCGGTCATCCTTAGCAAAGGC
GCCCCAAGAGGCGGTAAATGGCGAGGCATTTGCGCCTGAGGCATCTCCCCCTCCACCCGGCG
ACGATGGAGATGCTGGTGGGGAGGACGGTGGCGCGCCTGCGCCCCCTCCGCCCCCGGCTACA
AAGGGCGGTCCAGTAGCTGTAGGAAGGTCGCTGGAGATACAAACAACGCCGGACGTGTGCAT
GGAAATGCTGGCCGACAAGCTGAAGCTGCTAAACTACGAGGCGGATTTCTGCAGGAAGAAGA
AGCCCTACCGGAAACCCCTCTCGCGGCTCTATTTTTCGGGTGCCGCTCGCAAACCTCGAGCGAGC
AGTTCTTCTACTTTACCACTCTGGCGACCTGGCTGCTGGGCGTGGCTGGCGTGGAGCTGCCCG
CTCCCAAGGAGTTTGTATGACCCGAACCTTGACGTGCCAGAACATCCTGGGTGCGGTGAAGAAG
CTGGGCTTTGCGCCGCCAGCTACCACCCTACCAAGCTCACAGTGGGCAACGGCAAGGAGGT
GGTGGGTGTGCTGGACGGGCTGGTGGACTTCGTGCTGGAGCGGCGGCACCACAAGTACAGCC
GGCCCGCGTACGGAATGATGGGCAACCGGAGGAGGGCGTGCAACTGGACGATGAGGCGGA
GGCTGCCCGGATGGAGGGTGCAGGATGAGCTGGCGATGCCAGCCAGAACAGGCGGATGACG
ATGAGGAGGAGGAGGGCGTATACGTGGACCCGGGGCGCGGTGACGCCGCGGGCCAGGGAC
AGGGGCATCCGCGCGGATGGACGCGGAGAAGGCGGTGCTTGTGTCCAAGGTGGACCCACGC
TCTGGAAGATCGAGCTGGAGCGCGTGGCGCCGAAGCTGCGTATCACCATCGCCGCCGACTCG
AAGGACTGGCGCTCACATCTGGATGAGGCGCACAGCACAAGGAGGTGATCAGCAAGGCCTG
GCCCCGACAGCAAGACGTCGCTGGAGCGCCTGCGTGCGGACCTGAACGGCACGCTGGAGAAGC
TGCAGACGCGTGAGAAGTTCCTCAACGAGCAGTTTGAGAGCCTCATGCAGCAGTACCGCGCC
GCCCCGACACGTTACGGACGCTGCAGGAGACATAACAACCGCAAGACGGAGGCGGTGGCGGA
CCGGAACAGGAGATGCACCGCATCGGCGAGACGCTGGAGGAGGTGAAGGCCATGATGGAC
GAGAAGGGCAGCAACATCGCGGACGCCACGCCTGTGGCTCGCATCAAGACCGCCATCAAGCA
GCTTAACAAGGAGCTGCACGACATGGAGGTGCGCATCGGCGTGGTTAGCCACACGCTGCTGC
AGCTATCGCTGCGCAACAAGCGATTGCTGCAGGCGCAGGCGGCTCTCAGTGACGAGGAGGAG
GACTAGCTAGATCAGCGAGTGACAGAGGGCATGTGTGCGTACCGTGTGCGCGGTACAGCCG
TGGGATGGAAGAGGTGATGTGGCGGGTTCGGGACCCAGCATTTCGGTAGACCAGATCACTTAT
AGGTACAGAAAGACGGCTATATTGTTGGGGGCGGCGCACCTGGCTATGTATATACAAGCCG
TAGCGCAGAGCCGCTGCAATGCGGTGCTGTGCCTGTGCTCCCGTGGGTGTGCGGCGTTCGGG
TCAAGTTCATATAAGCTGTTGTGACTTGTGAGGCAGGCATGGCATATGGACAGGGCATCCCTG
CAAGGAAAGCAGGCAGCGGTATCCTTGTGGCGATGGGTCAAGCAGTGATGGAGGGGCGAAGC
GAGTTGCGGGCCTGTAAGCACAGGGTTGCCAAAAAAA (SEQ ID NO: 9)

FIG. 10B

Mouse

>Mm_IFT57 predicted peptide sequence

MAAAAVIPPSGLDDGVSRARGEGAGEAVVERGPAAHYHMFVVMEDLVEKLKLLRYEEELLRK
SNLKPPSRHYFALPTNPGEQFYMFCTLAAWLINKTGRAFEQPQEYDDPNATISNILSELSFGRTAD
FPPSKLKSQYGEQVCYVLDCLAEELKYIGFTWKRPSYPVEELEEEETVPEDDAELTLKVDDEEFVE
EETDNEENFIDLNLKAQTYRLDTNESAKQEDILESTTDAAEWSLEVERVLPQLKVTIRTDNKDW
RIHVDQMHQHKSGIESALKETKGFLLKLNHNEISRTLEKIGSREKYINNQLHLVQEYRGAQAQLSE
ARERYQQGNGGVTERTRLLSEVTEELEKVKQEMEEKGSSMTDGTPLVKIKQSLTKLKQETVQMDI
RIGVVEHTLLQSKLKEKCNMTRDMHAAVTPESAIGFY (SEQ ID NO: 12)

FIG. 10C

>MmIFT57 cDNA sequence

GCGAAGGCTGCAGAGATCCTGGCCGGAGCCCAGCCGGGCGCTGGGGG
TCTGAGCAGGGATGGCCGCCGCGCGCGGTGATCCCGCCGTCGGGCTTGGACGATGGGGTG
TCTCGGGCTCGCGGGGAAGGCGCAGGGGAGGCTGTGGTGGAGCGCGGGCCAGGAGCGGCCTA
CCACATGTTCTGGTGATGGAAGACTTAGTGGAAGCTGAAGCTGCTCCGCTACGAGGAGG
AGCTACTCCGAAAGAGCAATCTGAAGCCCCGTCAGACACTACTTTGCTCTGCCTACCAACC
CAGGCGAGCAGTTCTACATGTTTTGCACTCTTGCTGCGTGGCTGATCAACAAAAGTGGCCGTG
CCTTTGAGCAGCCTCAAGAATACGACGATCCCAATGCAACTATATCTAATATACTCTCTGAGC
TTCGCTCTTTTGGGAGAACTGCAGATTTTCTCTTCAAAATTAAGTCTGGTTACGGAGAACA
AGTGTGCTATGTTCTTGATTGCTTAGCTGAAGAAGCTTTAAATATATTGGTTTCACTTGGAAA
AGGCCATCATACCCAGTGAAGAAGCTAGAAGAAGAACTGTTCCAGAAGATGATGCCGAGTT
AACATTAAGTAAAGTGGATGAAGAATTTGTGGAAGAGGAGACAGATAATGAAGAAAACCTTA
TTGATCTCAACGTTTTAAAGGCCAGACCTATCGCTTGGACACAAACGAGTCTGCCAAACAAG
AAGATATTTTGAATCTACGACAGATGCTGCGGAATGGAGCCTAGAAGTTGAGCGTGTACTAC
CGCAGCTGAAAGTCACGATTAGGACTGACAATAAGGATTGGAGGATCCATGTTGACCAAATG
CACCAGCACAAAAGTGGGATTGAATCTGCTCTGAAGGAGACCAAGGGGTTTTTGGACAAGCT
CCATAATGAAATTAGCAGGACTCTGGAAGAGATTGGCAGCCGAGAAAAGTACATTAACAATC
AACTTGAGCACTTGGTTCAAGAATATCGTGGGGCCCAAGCCCAGCTAAGTGAGGCAAGGGAG
CGCTACCAGCAGGGCAATGGCGGAGTAACTGAACGGACCAGACTCCTCTCTGAGGTTACAGA
AGAATTAGAAAAGGTAAAGCAAGAAATGGAAGAGAAGGGCAGCAGCATGACGGACGGCACT
CCTTTGGTGAAGATTAAGCAGAGCTTAACCAAGCTGAAGCAAGAACTGTTTCAGATGGACAT
TAGAATCGGTGTGGTGGAGCACACGCTACTTCAGTCAAACTCAAGGAGAAGTGCAACATGA
CCAGGGACATGCATGCAGCTGTACCCAGAGTCAGCAATTGGCTTCTATTAAACACGTGGGC
TTCCATGCTTCTGATTATTTTCGTTTTATATCAATGATTTTTTAATGTTGCATTGATTTCCAAA
CACAATTTATACTTCTTCAAGCATATTCAGTGGGTATTTTGCACATGTGTTAATATCATGGTG
ATTATGATGGCCAAAGCCTGTACAATGAATATAGTATTTAATAAAGTACTTAAATTAATAA
AAAAAAAAA (SEQ ID NO: 11)

FIG. 10D

Human

>Hs_IFT57-1 gi|7022022|dbj|BAA91466.1| unnamed protein product [Homo sapiens]
MTAALAVVTTSGLEDGVPRSRGEGTGEVVLERGPGAAYHMFVVMEDLVEKLKLLRYEEEFRLRKS
NLKAPSRHYFALPTNPGEQFYMFCTLAAWLINKAGRPFEQPQEYDDPNATISNILSELSFGRTADF
PPSKLKSGYGEHVVCYVLDCFAEEALKYIGFTWKRPIYPVEELEESVAEDDAELTLNKVDEEFVEE
ETDNEENFIDLNVLKAQTYHLDMNETAKQEDILESTTDAAEWSLEVERVLPQLKVTIRTDNKDWR
IHVDQMHQHRSGIESALKETKGFLDKLHNEITRTLEKISSREKYINNQLNLVQEYRAAQAQLSEA
KERYQQGNGGVTERTRLLSEVMEELEKVKQEMEEKGSSMTDGAPLVKIKQSLTKLKQETVEMDI
RIGIVEHTLLQSKLKEKSNMTRNMHATVIEPATGFY (SEQ ID NO: 30)

FIG. 10E

>Hs_IFT57-2 chromosome 12 [ESTS BF089172]
DQRIHVDQMYQHKSGIESSLKESKRFFDKLHNE
ISKLTLEKISHCEKYINHQLHRVQEYPAAQTQLSDVRSQQGSGGVIERTRLLSEATED
TEHVKLEMECKCSSMTDGDSL VKIKQSLTKLKQETVQMDIRIGVVEHTLL (SEQ ID NO: 31)

FIG. 10F

Caenorhabditis elegans

>Ce_IFT57 gi|7504754|pir|T22994 hypothetical protein F59C6.9 - Caenorhabditis elegans
MLHHIKSLKSVLSRGQEGRFGEKRHSNTTFFITGIATDFTAALKSGAGENVIFILNSLADASLVHVG
FQWQKMIPPKEEDEDTA VDEQDEDDND DIVEEPMNFLDDDDDDNVIEIDLKAQGLATESKNPLQ
SVLQSNTDAITWKQEVERVAPQLKITLKQDAKDWRLHLEQMNSMHKNVEQKVGNGVPYLDNMS
KDI AKALERIASREKSLNSQLASMMSKFRRATDTRAE LREKYKAASVGVSSRTETLDRISDDIEQL
KQQIEEQGAKSSDGAPLVKIKQAVSKLEELQTMNVQIGVFEQSILNTYLRDHFNF SANLLNIM
(SEQ ID NO: 32)

FIG. 10G

IFT72

Chlamydomonas

>Cr_IFT72 partial predicted peptide sequence (lacking N-terminal end)

VYVIQQEFAALKDRNEQQRKRVDEVLTERRLNLESKAKQAESK
MSEIQASMDQRLNSMPPSQRNEYTTLVAEQQQLQADSKRFEEVLDELKALQASEGELAR
NPFKQRSLLQEQIRALTGKKYELTEERQSKRSPEELRADLMAKIKRDNTEVEQMTQQI
RELQDQIKKMEERVKSLGGATSGAVAAEEKANREKFEELLAKERHLNNFMDGFPSRKA
MKEKQKQKEDGIVGVLEKVMKMQGIIGSNLPSQKKYKEMQDELEYKKMQLENTQTTQERLK
EELTMRRTLEKIDTLEDKIKLELTQLAERQEAMEKEMGEFGSVEDIQRKANAARERMGA
CAVCCLKRKDLLRSIVAERGLKFQAKRAQLQDHNLVQLEKMEAKLKNLSAGVFEMDEFI
KAKESETNYRQLASNIAALVDDLNVHVKKAVV (SEQ ID NO: 14)

FIG. 11 A

>Cr_IFT72 partial Cdna sequence (lacking 5' end)

GTGTACGTGATCCAGCAGGAGTTCGCGGCGCTCAAGGACCGCAACGAGCAGCAGCGCAAGCG
CGTGGACGAGGTGCTCACGGAGCGCCTCAACCTCGAGTCCAAGGCCAAGCAGGCCGAGTCCA
AGATGTCTGAGATCCAGGCGTCCATGGACCAGCGCCTCAACTCTATGCCGCCAGCCAGCGCA
ACGAATACACCACGCTCGTGGCCGAGCAGCAGCAGCTGCAGGCCGACAGCAAGCGCTTTGAG
GAGGTGCTGGACGAGCTGGACAAGGCGCTGCAGGCCAGCGAGGGCGAGCTGGCGCGCAACC
CCTTCAAGCAGCGCAGCCTGCAGCTGCAGGAGCAGATCCGCGCGCTCACGGGGAAGAAGTAC
GAGCTGACGGAGGAGGAGCGGCAGAGCAAGCGCTCGCCCGAGGAGCTGCGCGCCGACCTCAT
GGCCAAGATCAAGCGAGACAACACCGAGGTGGAGCAGATGACGCAGCAGATCCGCGAGCTTC
AGGACCAGATCAAGAAGATGGAGGAGCGCGTCAAGAGCCTGGGCGGCGCCACAGCGGCGC
GGTGGCGGCGGAGGAAAAGGCCAACCGCGAGAAGTTTGAGGAGCTGTTGGCCAAGGAGCGC
CACCTAAACAACCTTTATGGACGGCTTCCCCAGCCGCAAGGCCGCCAAGATGCAGGAGAAGCA
GCAGAAGGAGGACGGCATCGTGGGCGTGCTGGAGAAGATGGTGAAGATGCAGGGCATCATTTG
GCTCCAACCTGCCAGCCAGAAGAAGTACAAGGAAATGCAGGACGAGCTCGAGTACAAGAA
GATGCAGCTGGAGAACACGCAGACCACGCAGGAGCGGCTCAAGGAGGAGCTGACCATGCGG
CGCACAGAGCTGGAGAAGATCGATACGCTGGAGGACAAGATCAAGCTGGAGCTGACGCAGCT
GGCGGAGCGGCAGGAGGCCATGGAGAAGGAGATGGGCGAGTTTCGGCAGCGTCGAGGACATC
CAGCGCAAGGCCAACGCCGACGCGAGCGCATGGGGGCGCTGCGCAGTGTGCTGTTTGAAGCG
CAAGGACCTGCTGCGCTCCATCGTGGCGGAGCGCGGCCTCAAGTTCCAGGCCAAGCGCGCGC
AGCTGCAGGACCACAACCTCCAGGTGCAGCTGGAGAAGATGGAGGCCAAGCTGAAGAATCTG
AGCGCGGGCGTATTCGAGATGGACGAGTTCATCAAGGCCAAGGAGAGCGAGACCAACTACCG
CCAGCTGGCCTCCAACATAGCGGCGCTGGTAGACGACCTCAACGTGCATGTCAAGAAGGCCG
TGGTGTAAAGAAGGAGGAGTGGTGTAAAGGGGTCTCCGGAGGAGGGCGCGTGCCGTTGTTGGG
GTGTTGGGGGCGCGGCGGAGAAGTACGTGCGTGTGGCGTTGTGCCCTTTCAGCAGGCTGCACG
TGTAAGTACGGTAGTCAAGGTGAAGGGCGGCCTGGGCACAGGAGGATGCTGACGCCGTGACGG
GTGACGATGACAGGCCATCGCGAGTTTGATCTCTGCTGTGCGAGTCATTGACTGGGTTCTTAG
ACAGGTGCGGCTACAAGCCCGGAGGTTGATGGCTCACCTCGCAGTGCGCGGACAGCAGGTGT
GGCGCATGCGCATGTGCCTCAGGAGCGCGGTGCGGACCAGGGAAGATGCGATGGGAGTAGGC
TAGGCCTGTGTGAGGGCCCTTGCCGAAGCGCCACGGCCATTCCATGGCCTGGCCCCGAAGGCA
GCGCTCGTGGTTGGATACTGACCAGCGCGCTCAAGCGGCGTACGATGTGAGAAGTGGAGCTA
CCGCCCCCTGCACAAGGGGTGATGTACATACTGTTATTTAGGAGTCCGCTGCTTATAGCTACTG
GACTGCAGAAGAAGGAGGCTGCAAGGATCTGATGGAGGCGCTGGTGTGTATGGATGACGCTG
TAAGAGATGCACAAGAGAAAAA

(SEQ ID NO: 13)

FIG. 11B

Human

>Hs_IFT72 gi|13376669|ref|NP_079379.1| hypothetical protein FLJ22621
MEEVMNGYNMLKAQNDRETQSLDVIFTERQAQEKQIRSVEEEIEQEKQATDDIIKNMSLENQVKY
LEMKTTNEKLLQELDTLQQQLDSQNMKKESLEAEIAHSQVKQEAVLLHEKLYELESHRDQMIAED
K SIGSPMEEREKLLKQIKDDNQEIASMERQLTDTKEKINQFIEEIRQLDMDLEE HQGEMNQKYKEL
KKREEHMDTFIETFEETKNQELKRKAQIEANIVALLEHCSRNNINRIEQISSITNQELKMMQDDL NFK
STEVQKSQSTAQNLTSDIQLQLDLQKMELLESKMTEE QHSLKSKIKQMTTDLEIYNDLPALKSSG
EEKIKKLHQERMILSTHRNAFKKIMEKQNI EYEALKTQLQENETHSQLTNLERKWKHLEQNNFAM
KEFIATKSQESDYQPIKKNVTKIAEYNKTIVDALHSTSGN (SEQ ID NO: 33)

FIG. 11C

11

IFT88

Chlamydomonas

>Cr_IFT88 predicted peptide

MSYGGTEEDDLYGGYDEQSNPLAGSGGAAFKALGADGAPPGTAMMGPPGTAMKSFVPGTA
MRGGTAMQQDPSLARPMTSNRGAGFTSAPNKKFDPLNRSMSGSTLGSSGGGAMLVARKGDT
SPEEQARGMEKTVHELLEKSAADAANKNDINSALENAMKNERKLCRFREQNNMADQIN
LELMYAVDFNLAHMYHMKNKYSEALNLYTAIVRNKNFPQSGWLRVNMGNHFEQKKYPSA
IKMYRMALDQISATAKEVRFKIMRNIGLSFVRMGQYPDALQSFATVMDNVPDHQTGYNLV
MCNYALSDREGMKNAFIKLLKVSPSEMDDDDDDDDPMGDDDMQVMTMDDGLKDEMCRNT
IITRLIVKAAQLISEKVDRANGFEGGFMWCCEQLRDAGYTKLANEVELAKATRFMGQKQF
DKAVGVFKDFEKKPRVKARAATNLAFLYFLEGETDQADKYSEMALKSDRYNARAYVNKG
CVLVERGDLEGARSLFNEAAGIDPYCVAIYNLGLVSQRLNELPYALAAFKKLHNMVDPN
VEVIHQIATTYDMMGDFKNAVWVFWLLTSLVSNPDGVLARLGAIHARFDDEAKALHYYQE
SHRVYPVNMDVISWLGAYHVKSEVYEKAMPFFDLASKIQPQEVKWALMVASCYRRTNNLP
AALGKYKQIHTQHPDNVECLRYLVHLCSELGRRAEAAEYMTKLKKAEEAAVPEATTAAAP
AAAAAGSGMGGMGGLDDDIGSSAVSAQNRGKKMLVKEHMGGGGGKDNDDWGNEQLGDDLL
PM (SEQ ID NO: 16)

FIG. 12A

>Cr_IFT88 gi|11528334|gb|AF298884.1|AF298884 Chlamydomonas reinhardtii protein IFT88 (IFT88)
 CGGCAACTTGACACTGAGCTACTCGAAGGCAGGGCCGTGTGCAGAGCTCCTTCCCCACTATC
 CTTCCTTTGCGTACCATACTTATCTTGCTAACAGCCTATAGAAGATGAGCTACGGGGGCACGG
 AGGAGGATGACCTTTATGGAGGATATGATGAGCAATCGAACCCGCTTGCGGGCTCGGGTGGT
 GCCGCATTTAAGGCACCTGGGGCCGATGGAGCTCCTCCAGGCACCGCCATGATGGGGCCGCCT
 GGCACGGCCATGAAGAGCTTCGTGCCAGGCACGGCTATGCGGGGCGGCACGGCGATGCAGCA
 GGACCCCAGCCTGGCGCGGCCTATGACCTCGAACC GG GTGCTGGCTTCACGTGCGGCGCTAA
 CAAGAAGTTTGACCCCCCTCAATCGCTCAATGGGGTCGACACTGGGCTCGTCGGGGGGTGGCGC
 AATGCTGGTGGCTCGCAAGGGTGACACCAGCCCGGAGGAGCAGGCGCGCGGGATGGAGAAG
 ACGGTGCATGAGCTGCTTGAGAAGAGCGCGGCGGACGCGGCTAAGAATGACATCAACTCGGC
 CCTGGAGAACGCCATGGAGGCGAAGAAGAATGAGCGAAAGCTGTGCCGCTTCCGGGAACAG
 AACACATGGCGGACCAGATCAACCTGGAGCTGATGTACGCCGTGGACTTCAACCTGGCACA
 CATGTACCACATGAACAAGAACTACAGCGAGGCGCTGAACCTGTACACAGCCATCGTGCGCA
 ACAAGAACTTCCCGCAGTCGGGTGGCTGCGCGTCAACATGGGCAACATCCACTTCGAGCAG
 AAGAAGTACCCCTCCGCCATCAAGATGTACCGCATGGCGTTGGACCAGATCAGCGCCACCGC
 CAAGGAGGTCCGCTTCAAGATCATGCGCAACATCGGGCTGTCGTTTCGTGCGCATGGGCCAGTA
 CCCCAGCGCGCTGCAGTCCTTCGCCACGGTCATGGACAACGTGCCCAGCACAGACCGGCTA
 CAACCTGGTTCATGTGCAACTACGCGCTGAGCGACCGCGAGGGCATGAAGAAGCCTTCATCA
 AGCTGCTCAAGGTGAGCCCATCCAGCGAGATGGATGACGATGACGACGACGACCCCATGGGC
 GATGACGACATGCAAGTGATGACCATGGATGACGGGCTGAAGGACGAGATGCGCAAGCGCA
 ACACCATCATCACGCGCCTCATTGTCAAGGCCGCGCAGCTCATCTCCGAGAAGGTGGATCGCG
 CCAACGGCTTTGAGGGCGGCTTCATGTGGTGTGCGAGCAGCTGCGCGACGCGGGCTACACC
 AAGCTGGCCAACGAGGTGGAGCTGGCCAAGGCGACCCGGTTCATGGGGCAAAGCAGTTTGA
 CAAAGCCGTGGGCGTGTTCAAGGACTTTGAGAAGAAGGAGCCGCGCGTCAAGGCGCGCGCCG
 CCACCAACCTGGCGTTCCTGTACTTCTGGAGGGCGAGACCGACCGAGCCGACAAGTACAGC
 GAGATGGCGCTCAAGAGCGACCGCTACAACGCACGAGCCTACGTCAACAAGGGATGCGTGCT
 GGTGGAGCGCGCGCATCTGGAGGGAGCGCAAGCCTGTTCAACGAGGCTGCCGGCATCGACC
 CCTACTGCTGGAGGCCATCTACAACCTGGGCTGGTGAGCCAGCGCCTGAACGAGCTGCCGT
 ACGCGCTGGCGCGTTCAGAAGCTGCACAACATGGTGCCCGACAACGTGGAGGTATCCAC
 CAGATCGCCACCACGTACGACATGATGGGCGACTTCAAGAACGCGGTCAAGTGGTTTGAGCT
 GCTCACCTCGCTGGTCAGCAACGACCCCGCGGTGCTGGCGCGACTGGGAGCCATCCACGCCA
 GGTTTCGACGACGAGGCCAAGGCGCTGCACTACTACCAGGAGTCGCACCGCGTGTACCCGGTG
 AACATGGACGTCATCTCCTGGCTGGGCGCCTACCATGTCAAATCGGAGGTGTACGAGAAGGC
 CATGCCCTTCTTTGACCTGGCCTCCAAGATCCAGCCGAGGAGGTCAAGTGGGCGCTCATGGT
 GGCGTCTGCTACCGCCGACCAACAACCTGCCC GCGCGCTGGGCAAGTACAAGCAAATCC
 ACACGCAGCACCCCGACAACGTTGAGTGCCTGCGCTACCTGGTGACCTGTGCTCCGAGCTGG
 GCCGCCGCGCGGAGGCCGCGGAGTACATGACCAAGCTCAAAAAGGCGGAGAAGGCGGCGGT
 GCCCGAGGCAACGACAGCGGCGGCGCCCGCGCGCGCAGCTGGCAGTGGCATGGGTGGCA
 TGGGCGGCCTGGACGACGACATTGGCAGCAGCGCGGTGTGCGCGCAGAACC GCGGCAAGAAG
 ATGCTGGTCAAAGAGCACATGGGTGGCGGCGGTGGCAAGGACAACGACGACTGGGGAAACG
 AGCAGCTTGGGGACGACCTGCTGCCCATGTAAACCGCAGTGCTGCCACAGGGCTTGGCGGGG
 GCGGGGCGTCAGCGCAGCCAGTGGGGCTACCGCCGCGGCCTGGCGGAGGTGGCGGCGGCGCA
 GCTGGCGGAGCCATGCGCGCCAGGGCCAGGGGCTGTGGGGAGGTGATGGCGAGGGCGAGG
 ACGACGACCACCTAAAAGCGCTGGGGCTGGGGGTGGGGTTGGTGGGCGGCCGAGCGGGGGC
 GCGCTGTCTGCCGCGACGGGGCGCGTGAAGGCCGATGTCAGCCGCGCCGCTCTACCCGGA
 GTTCGGGGCCGAGCCTGCGTTTGGAAGGTGCTGAGCTTTGGCTCGGCTGGGACGTCCAGCGC
 ACTGCCTGAGCTGGCGTAAAGCCATTACCGCTGATGCAGCCCGCCATTCGTGTGTGTGCGTAT
 ATGTGTGTGAATGTATGTGTGTGCTAGGTAAGCACGAGATGCGTGTGCGTTTGTGTTGCGC
 CTGCGCCACTTTTGGCTGCAGGGGTCCCGAGGTGAGTGTGAAGCCCGGCCCGGGCGGAAATG
 GGTGCATGGCAGTTGCGGCGCATGCATGCGGAAGTGAGCGAAGTGCAATAGGCTCTGCAGG
 GCATGGATGCGTAGGAACAGGGCTTGAATGATATCACTATGTGGCGTTGACGGGCCCCACAAC
 TTACATGGGAGAGGCACGCCGAAAGGGTGTGTGAGGATCAGGAGCTTGGACTTGGCGTAGT
 CTGTACATGGTGCCAGTCTACGTGCGGGCATAGACACATACAGGACCTGTGCTGCTGCGGAGT
 CCGCATCTGCAGGAAGTCGTGCCGGGTGTCACGAGTGCGGACGATGCGGATTGTGGAGGAGT
 ACAGATGGGGCCATCGGACATACTGGCACAGTGGCACCAACCGGCCCCCTGCGACGCATGCTC
 GCACGACCCTGTAAAGGTGAGCCCAAAAAA (SEQ ID NO: 15)

FIG. 12B

Humans

>gi|5729800|ref|NP_006522.1| Tg737 protein; Probe hTg737 (polycystic kidney disease)
MMQNVHLAPETDEDDLYSGYNDYNPIYDIEELENDAAFQQAVRTSHGRPPITAKISSTAVTRPIA
TGYGSKTSLASSIGRPMTGAIQDGVTRPMTAVRAAGFTKAALRGSAFDPLSQSRGPASPLEAKKK
DSPEEKIKQLEKEVNELVEESCIANSCGDLKLALEKAKDAGRKERVLRQREQVTTPENINLDLTY
SVLSNLASQYSVNEMYAEALNTYQVIVKNKMFSNAGILKMNMGNIYKQRNYSKAIKFYRMALD
QVPSVNMKMRIMQNIQVTFIQAGQYSDAINSIEHIMSMAPNLKAGYNLTICYFAIGDREKMKK
AFQKLITVPLEIDEDKYISPSDDPHTNLVTEAIKNDHLRQMERERKAMAKEYITTSAKLIAPVIETSF
AAGCDWCVEVVKASQYVELANDLEINKAVTYLRQKDYNQAVEILKVLEKKDNRVKSAAATNLS
ALYYMGKDFAQASSYADIAVNSDRYNPAALTNKGNTVFANGDYEKAAEFYKEALRNDSSCTEAL
YNIGLTYEKLNLRLDEALDCFLKLHAILRNSAEVLYQIANIYELMENPSQAIEWLMQVVSIVPTDPQ
VLSKLGLYDREGDKSQAFQYQYYSYRYFPCNIEVIEWLGAYYIDTQFWEKAIQYFERASLIQPTQ
VKWQLMVASCFRRSGNYQKALDITYKDTHRKFPENVECLRFLVRLCTDLGLKDAQEYARKLKRL
EKMKEIREQRIKSGRDGSGSRGKREGSASGDSGQNYSSASKGERLSARLRALPGTNEPYESSNNK
EIDASVYDPLGPQIERPKTAAKKRIDEEDFADEELGDDLLPE (SEQ ID NO: 34)

FIG. 12C

Caenorhabditis elegans

>Ce_Osm-5 gi|12659061|gb|AAK01173.1|AF314195_1 OSM-5 [Caenorhabditis elegans]
MANSTFREDDDDFYGGFDSYDKAYDIQNITQNPQFQQAVARSSHGRRPTASQMGRDASSSYGKP
PGTMMGNQSRMGGR TAMANNNEPARPMTAVRGAGYTSFANKVQAAERPLSTENSGENGEEKCR
QMENKVMEMLRRESMLASEKKKFKEALDKAKEAGRERAVVVKHREQQGLVEMMNLDLTFTVLF
NLAQQYEANDMTNEALNTYEIIVRNKMFPNSGRLKVNIGNIHFRKREFTKALKYYRMALDQVPSI
QKDTRIKILNNIGVTFVRMGSYDDAISTFDHCVEENPNFITALNLILVAFCIQDAEKMREAFVKMIDI
PGFPDDDDYMKEKDDDDVLLNQTLSNDMLKNWEKRNKSDAEKAIITAVKIISPVIAPDYAIGYEWC
LESLKQSVHAPLAIELEMTKAGELMKNGDIEGAIEVLKVFN SQDSKTASAAANNLCMLRFLQGGR
RLVDAQQYADQALSIDRYNAHAQVNQGNIAYMNGDLDKALNNYREALNNDASC VQALFNIGLT
AKAQGNLEQALEFFYKLHGILLNNVQVLVQLASIYESLEDSAQAIELYSQANSLVPNDPAILSKLA
DLYDQEGDKSQAFQCHYDSYRYFPSNLETVEWLASYYLETQFSEKSINYLEKAALMQPNVSKWQ
MMIASCLRRRTGNYQRAFELYRQIHRKFPQDLCLKFLVRIAGDLGMTEYKEYKDKLEKAEKINQL
RLQRES DSSQGRHSANSTHSLPPSGLTGLGSGSGSGSGGGTRQYSAHVPLLLDSGTPFTVAQRDM
KAEDFSYDDPVAISSRPKTGTRKTTTDTNIDDFGDFDDSLLPD (SEQ ID NO: 35)

FIG. 12D

IFT122

Chlamydomonas

>Cr_IFT122 partial predicted peptide sequence (lacking N-terminal end)

HEGHFRRAPHFAYAKETLLKMDDTKGLITLYVEAEKWDDAFLLLHAHPECRQDVYLPYAKWLSN
QDRFDEARLAYQEGGFPSLATRILEQLCANAVVETRYADAIFYYYQLAMEALKSIKNPPSNMAPS
DRSALERFTELYDRAEVYYAYEVVHKSVHSPFRTTHPDTLNFNASRFLLMRLPPREVPLGVSVVN
VVYVLAKQAVEAGAFKLARFAYNKLQTLVLPAAWQAEVDLASVVIRSKPFSKEDLLPVCWRCS
TTNPLLNTQGDYCINCGAPFIRSFVTFEHLPPVVEFELEPGVDDEEAGRLLGEDAGMEAARRERKAE
RQAKAAEVGGNMLRLDQNEIDRMDDAFAAQMMVPNTTIRVDRAMLRRLKTAEVMVRTWPNPV
IPKQYFRSHGPGGA AVLQDPADTSSSRMSSRWRRWSVARRPSAAPCAARAWRRARTPRMRVPA
ATSWAGRWAARVGPLGAPARRACPCSSRAGRWCERGLSGAYRVRGWIPDVGGE

(SEQ ID NO: 18)

FIG. 13A

>Cr_IFT122 partial cDNA sequence (lacking 5' end)

GGCACGAGGGCCACTTCCGCCGCGCGCCGCACTTTGCGTACGCCAAGGAGACGCTGCTCAAA
ATGGACGACACCAAGGGCCTGATCACGCTGTACGTGGAGGCTGAGAAGTGGGATGACGCCTT
CCTGCTGCTGCACGCGCACCCCGAGTGCCGGCAGGACGTGTACCTGCCCTACGCCAAGTGGCT
CAGCAACCAGGACCGCTTCGATGAGGCGCGCTGGCGTACCAGGAGGGCGGCTTTCCAGCC
TGGCCACCCGCATCCTGGAGCAGTTGTGCGCCAACGCGGTGGTAGAGACGCGGTACGCGGAC
GCCGCTTCTACTACTATCAGCTGGCCATGGAGGCGCTCAAGAGCATCAAGAACCCGCCCTCC
AACATGGCGCCCTCGGACCGCTCCGCGCTGGAGCGCTTCACGGAGCTGTACGACCGCGCCGA
GGTGTACTACGCCTACGAAGTGGTGCACAAGTCCGTGCACTCGCCCTTCCGCACCACGCACCC
CGACACGCTCTTCAACGCCTCGCGCTTCCTGCTCATGCGCCTGCTGCCGCCGCGCGAGGTGCC
GCTGGGCGTCAGCGTGGTCAACGTGGTGTACGTGCTGGCCAAGCAGGCTGTGAGGCGGGCG
CCTTCAAGCTGGCGCGCTTCGCGTACAACAAGCTGCAGACGCTGGTGTGCGGCGGCCTGGC
AGGCGGAGGTGGACCTGGCATCCGTGGTTCATCCGCTCCAAGCCTTTCTCAGACAAGGAGGAC
CTGCTACCGGTGTGCTGGCGCTGCTCCACCACCAACCCGCTGCTCAACACGCAGGGCGACTAC
TGCATCAACTGCGGCGCGCCCTTCATCCGCTCCTTCGTACCTTCGAGCACCTGCCCGTGGTGG
AGTTTGAGCTGGAGCCGGGCGTGGACGACGAGGAGGCGGGCGCCTGCTGGGCGAGGACGCG
GGCATGGAGGCGGCGCGGCGGAGCGCAAGGCGGAGCGGCAGGCCAAGGCGGCGGAGGTGG
GCGGCAACATGCTGCGGCTGGACCAGAACGAGATCGACCGCATGGACGACGCCTTCGCGGCC
CAGATGATGGTGCCCAACACCACCATCCGCGTGGACCGGGCCATGCTGCGGCGGCTCAAGAC
GGCCGAGGTGATGGTGGCACCTGGCCCAACCCCGTCAATCCCAAGCAGTACTTCCGCAGTCA
TGGACCAGGAGGTGCCGCTGTGCTGCAGGACCCTGCGGACACTTCTTCGAGCAGGATGAGTTC
GAGATGGCGGCGCTGGAGCGTGGCACGGCGCCCTTCAGCCGCACCACCGTGCAGCGGCGAGGG
CCTGGCGCCGGGCGAGGACGCCGAGGATGAGGGTGCCGGCGGCAACAAGCTGGGCGGGCCG
TTGGGCGAGCGCGCTGGGCCCATTGGGGGCGCCAGCAAGGCGCGCATGTCCGTGCCCTTCCA
GCAGGGCCGGCCGCTGGTGTGAGCGGGGTGCGCTATCGGGCGCTTACCGGGTGCCTGGGTGG
ATTCCGGATGTAGGCGGGGAATAGGAGCTGCCGCTAGTGGCGTTGCAGAGGCCTTCGTTAC
GCAGCAGAGGGGGCACGAGGAGGACGTGAACGGGTGTCTTCATGCTGCTTGTGGTCTGACTT
GGTAGGACGGGCGTTGGTGCCATCATTAGGCTGCCCCGTCCCGGTCCACCATAGGAGCTGCGAT
GGGCCTGAAGCAAGGCCCATGCACGGTGGCCGGGCACATGATGCATGACGGGACAGAGCACG
GGACTTGTGGAACAGTGATACATATGCCCGCGCAGAGACTGCGTGTCTCGAAGCGGGCACA
AATTGGGACATGTCGGCGTACAGACAAACGATGATGATGACAGGATGACAGTTGTTGTGCGG
CAGGGGGGCTCCCAAGCCCAGTTGAGGCCAGGCAGGTTTGGTTGAATGGGGATGCACAGTG
GCAGTGCTAATGCGCTGGCGCTATGAGCGTCCATGGTGTGGCGGCCTCAAGTACAAGACACC
TTATAGTAGTTCAATCTGCCCCGCAAAAAAAAAAAAAAAAAAAAAA

(SEQ ID NO: 17)

FIG. 13B

Human

>gi|11360072|pir|T43484 hypothetical protein DKFZp434K016.1 - human (fragment)
TLLQPLKGHKDTVYCVAYAKDGKRFASGSADKSVIIWTSKLEGILKYTHNDAIQCVSYNPITHQLA
SCSSSDFGLWSPEQKSVSKHKSSSKIICCSWTNDGQYLALGMFNIGIIRNKNKEEKVKIERPPGGSLS
PIWSICWNPSSRWESFWMNRENEDAEDVIVNRYIQEIPSTLKS AVYSSQGEAEEEEPEEEDDSPRD
DNLEERNLILAVADWGQKVSFYQLSGKQIGKDRALNFDPC CISYFTKGEYILLGGSDKQVSLFTKD
GVRLGTVGEQNSWWWCQAKPDSNYVVVGCQDGTISFYQLIFSTVHGLYKDRYAYRDSMTDVIV
QHLITEQKVRIKCKELVKKIAIYRNRLAIQLPEKILYEL YSEDLSDMHYRVKEKIIKKFECNLLVVC
ANHIILCQEKRLQCLSFSGVKEREWQMESLIRYIKVIGGPPGREGLLVGLKNGQILKIFVDNLFAIVL
LKQATAVRCLDMSASRKKLAVVDENDTCLVYDIDTKELLFQEPNANSVAWNTQCEDMLCFSGG
GYLNKASTFPVHRKQLQGFVVGYNGSKIFCLHVFSISAVEVPQSAPMYQYLDRLKFKEAYQIACL
GVTDTDWRELAMEALEGLDFETAKKAFIRVQDLRYLELISSIEERKKRGETNNDLFLADVFSYQG
KFHEAAKLYKRSGHENLALEMYTDLCMFEYAKDFLGSGDPKETKMLITKQADWARNIKEPKAAV
EMYISAGEHVKAIEICGDHGWVDMLIDIARKLDAEREPLLLCATYLLKKLDSPGYAAETYLKMGD
LKSLVQLHVETQRWDEAFALGEKHPEFKDDIYMPYAQWLAENDRFEEAQKAFHKAGRQREAVQ
VLEQLTNNAVAESRFNDAAYYYWMLSMQCLDIAQDPAQKDTMLGKFYHFQRLAELYHG YHAIH
RHTEDPFSVHRPETLFNISRLLHSLPKDTPSGISKVKILFTLAKQSKALGAYRLARHAYDKLRGLYI
PARFQKSIELGTLTIRAKPFHDSEELVPLCYRCSTNNPLLNNLGNVCINCRQPFIFSASSYDVLHLVE
FYLEEGITDEEAISLIDLEVLPRKRRDRQLEIANSSQILRLVETKDSIGDEDPFTAKLSFEQGGSEFV
PVVVSRLVLRSMRRDVLIRWPPPLRWQYFRSLLPDASITMCPSCFQMFHSEDYELLVLQHGCCP
YCRCKDDPGP (SEQ ID NO: 36)

FIG. 13C

Caenorhabditis elegans

>Ce_Daf10 Z82266 F23B2.4
MTMKKISRKLGFHGEQVCYIDLAFKPDGSELLLAADNKVYLFVDVNEGGQMQLTKGHKDLVYTV
AWSHNGELFASGGADKLVLWNEKHEGTLRYSHTDVIQCMFMNPCNQILLTCALNEFGLWSTAD
KNVIKQRSVVRCCSCAWNTDGTIFAIGHGDGTITLRKGTNATEEPSIIIQRDNEPIWGIAFSSNRTFA
SRDSQGNPMGIDEIMAVIDWNKTL SFYSLDGT FIESKNLEFEPHCISYCLNGEYLLIGGSDKILKIYT
RKGVLLGTVAQMDHWIWSVTVRPNSQTVAMGCVDGTIACYNLVFSTVHCVDHARYANRKSMT
DVVFQNLEYRTSSNICCHDLVKKMSLYDTKLAVQLSDKIQIYKQTGGVSKNERRKQLKYTLQDTI
RKDLSFSLMVVTHGHLVVCNDEKLECYDFKGIKKRSWNMKSIVRYLRVLGGPAHRETLVLGTTD
GGVYKV FIDNDYPILLDSRKTAIKCIDINANRTVLASIEDTLVCKWSDIATGETLLQEPGCYSVVFN
TVNENLFAFTTNMMLHVRTLAA PGHTTRGVGYVLGFVKNRTFCLVQYNLIPLEVPYTIHLYQYIER
GDFKEALRIACLG VVKNDWKYLANKALDALEFDVARKAYKRVRDRKMLRMVWELKKMKMSNG
EPDAILRATILAYTKKFREAAKIFKENG FENRAMELFTDMRMFDDVQEVMTTASGETKKMLMRK
RASWARDANQPKIAAEMLISSGDLDKAALLIIDNDWLELAIEISHKIDRSLETMKKLSAYFIRKHE
FGLASRIFQSINDMKSI VDMHVNAGHWTD AFAIADRH PKYVEDVYLPYARFLAERDRFEEAQKAF
HRAGKEQEAMHVLEQLTSNSVNENRFADAGCGLNPLLGGMSCIHCE TPFIISFVSFDILPLIEFKIE
NDISFDEAKELIESEPPLSDD DYNPLRGLKKGIKEIILNRESLSKLEQGHVIIQTFFPPLAPKFLFNVM P
SITIAQCKGCNKVFDLDDFEMA CLRKGHCPFCRTSYDRNEAFFVDEEDEDNTNIPSFGQFSRFS
(SEQ ID NO: 37)

FIG. 13D

IFT139

Chlamydomonas

>Cr_IFT139 partial predicted peptide sequence (lacking C-terminal end)

MADRVLALVHYYAREGYFRHVQTVVCNEVLKKRPGDGVLTFWRAYGLLMEGNTADAMRDLSSIQ
GNSDLELAVAAAQLLGHESAKVPDHDAIIDLQAKLEIEERTASDQPCLHLASFYLYTKSKERARGL
VERVLRNQPDMVPAQVLLGWIISQQQDDEYDMLFDESELDDALSHFEQAVEHDHNDLQALLGK
AKIMELKKQLGPCLDVLTEINVRFGWFPALVEKTRMLMMLGDWEQVTETLQRVLAADQQNIM
AQAWNCMISLTREGNNKQAAQLQDLFSSMNRQEPKNAELFFRVARPFGRACSDPTLLGITYLM
ADRAAQLRPEMAAYVVEAAAQKLMMDETTNATERFTQALQLDELNLEANAGALEAQIMAGELE
EAAGQIMFLEDMFTNAAAAGGGKRGKRGTDGMDDDPDMADPSLGTSSDNPTLLYLKGLLAWKQ
GMPSEGLGLLERSIAALFSAAADFHGPSLELYAALNPARITAMVRLLLQSIGGEPRAPTEAPSPLISK
VTRALDLLNKQAPALQESALLHARALYLNGLDGLRKAGEILRMNPEESSAHLICSVYVAQDK
PELAVSALDQAVSSNFAIRETPLYHVVQAKVLVANNKLDDAKRVLESAMNLPGVRTALT TVQQRA
RLGRKVVEPTLHERATVYLLADVLARQSKIPDAPEAKKYIQDAIREFEGTSEEVRVTVADCELA
ARGDVEGALKKLRIPKESPHYVKARMAMADIYLRHRKDKAAAYIKCYMDLVDHTPDYDSYCML
GEAFMQIQEPEKAVRA (SEQ ID NO: 20)

FIG. 14A

>Cr_IFT139 partial Cdna sequence (lacking 3' end)

GGGTAGTCGTAACGTCTCAAGTATCGGACGCACTATTTGCAACTGCTTATTTTCGCATGGCTCC
CCCATCAATGAACTTGCTTCGTCCCTATGGCCTCCCATCGAGCGTGCAAGGTATCACCGTGTAT
ACACATGCTAAATATACTTCGTTAAATTGGAGTTCACCGCGGAGGCCTGAACATTTGCCGAAC
CGTCTCTGAGGAAGCAGAAGCAATAGCAGTGCATACAAATAGCCATGGCGGACAGGGTACTT
GCCCTGGTCCATTACTATGCTCGCGAGGGCTATTTTAGACATGTGCAGACGGTGTGCAACGAA
GTGCTCAAGAAGCGGCCCGGAGATGGCGTACTCACATTCTGGCGTGCCTATGGACTGCTCATG
GAGGGCAACACGGCGGACGCCATGCGTGACCTCTCCAGCATCCAGGGCAATTCTGACCTTGA
GCTGGCGGTTCGACGCCGCGCAACTACTGGGTACGAATCCGCCAAGGTGCCCCGACCACGATG
CCATCATTGACCTCCAAGCCAAGCTGGAGATCGAGGAGCGCACCGCCAGCGACCAGCCCTGC
CTGCACCTGGCCTCCTTCTACCTGTATACCAAGTCCAAGGAGCGCGCCCGCGGTCTGGTGGAG
CGCGTGCTGCGCAACCAGCCCGACATGGTGCCGGCGCAGGTTCTTCTGGGCTGGATCATCATC
AGCCAGCAGCAGGACGACGAGTACGACATGCTGTTTGACGAGTCCGAGCTGGACGACGCCCT
CAGCCACTTCGAGCAGGCGGTGGAGCACGACCACAACGACCTGCAGGCGCTGCTGGGCAAAG
CCAAGATCATGGAGCTGAAGAAGCAGCTGGGGCCCTGCCTGGACGTGCTGACGGAGATCAAC
GTGCGCTTCGGCTGGTTCGTGCCGGCGCTGGTGAAAAGACGCGCATGCTCATGATGCTGGGC
GACTGGGAGCAGGTGACGGAGACGCTGCAGCGGGTGCTTGCGGCGGACCAACAGAACATCAT
GGCGCAGGCCTGGAAGTGCATGATCTCCCTCACTCGCGAGGGGAACAACAAGCAGGCGGCCA
AGCAGCTGCAGGACCTGTTCACTCAATGAACCGCCAGGAGCCCAAGAACGCCGAGCTCTTC
TTCCGCGTCGCCCCGCCCTTCGGCCGCTGGCCTGCAGCGACCCACGCTGCTGGGCATCACC
TACCTCATGGCCGACCGCGCCGCGCAGCTCAGGCCGGAGATGGCGGCCTACGTGGTGGAGGC
AGCTGCTCAGAAGCTGATGATGGACGAGACCACCAACGCCACGGAGCGCTTCACGCAGGCGC
TACAGCTGGACGAGCTGAACCTGGAGGCCAACCGGGGCGCGCTGGAGGCGCAGATCATGGCG
GGCGAGCTGGAGGAGGCGGCGGGGAGATCATGTTCTGGAGGACATGTTACCAACGCCCGC
GGCGGCTGGCGGCGGCAAGCGCAAGGGCCGCGGCACCGGCGACATGGACGACGACCCCGAT
ATGGCCGACCCAGTCTGGGCACCTCCTCCGACAACCCACGCTGCTCTACCTCAAGGGTCTG
CTGGCCTGGAAGCAGGGCATGCCGTCCGAGGGCCTGGGTCTGCTGGAGCGCTCCATTGCCGCC
CTGTTCTCCGCCCGCCGCGACTTCCACGGCCCCAGCCTGGAGCTGTACGCGGCGCTCAACCCG
GCGCGCATCACCGCAATGGTGCGGCTGCTGCTGCAGAGCATCGGCGGTGAGCCGCGCGCTCC
CACTGAGGCGCCGTCTCCGCTCATCAGCAAGGTCAACCGCGCGCTGGACCTGCTGAACAAGCA
GGCGCCGGCGCTGCAGGAGAGCGCGCTGCTGCACGCGCGCGCTGTACCTGAACGGCAACC
TGGACGGCGCGCTGCGCAAGGCGGGCGAGATCCTGCGCATGAACCCCGAGGAGAGCTCCGCG
CACCTGCTCATCTGTTCCGTGTACGTGGCGCAGGACAAGCCCGAGCTGGCCGTCAGCGCGCTG
GACCAGGCCGTCAGCAGCAACTTCGCGATCCGCGAGACGCCTCTGTACCACGTGGTCCAGGCC
AAGGTGCTGGTGGCCAACAACAAGCTGGACGACGCCAAGCGCGTCTCTGGAGTCCGCCATGAA
CCTGCCGGGCGTGCGCACAGCGCTCACCGTGCAGCAGCGCGCGGACTAGGGCGCAAGGTGG
TCGAGCCCACGCTGCACGAGCGCGCCACCGTGTACCTGCTGCTGGCGGACGTGCTGGCGAGG
CAGTCCAAGATACCGGACGCACCAGAGGCCAAGAAGTACATCCAAGACGCCATCCGCGAGTT
CGAGGGCACACGCGAGGAGGTGCGCGTACCGTGGCGGACTGCGAGCTGGCCATTGCGCGCG
GCGACGTGGAGGGCGCGCTCAAGAAGCTGCGGCGCATCCCCAAGGAGTCTCCGCACTACGTG
AAGGCGCGCATGGCCATGGCCGACATCTACCTGCGCCACCGCAAGGACAAGGCCGCTACAT
CAAGTGCTACATGGACCTGGTGGACCACACGCCCGACTACGACAGCTACTGCATGCTGGGCG
AGGCGTTCATGCAGATCCAGGAGCCGGAGAAGGCAGTGCGCGCT

(SEQ ID NO: 19)

FIG. 14B

Human

>Hs_IFT139-1 ref|NT_005498.3|Hs3_5655 Homo sapiens chromosome 3
SFIQAGIYYSQEKYFHHVQAAAVGLEKFSNDPVLKFFKAYGVLKEDREAIQELEYSLKEIRKTVSG
TALYYAGLFLWLIGRHDKAKEYIDRMLKISRGFREAYVLRGWVDLTSDKPHTAKKAIEYLEQGIQ
DTKDVLGLMGKAMYFMMQQNYSEALEVVNQITVTSGSFLPALVLKMQFLARQDWEQTVEMG
HRRILEKDESNIDACQILTVHELAREGNMTTQATNHVRNLKALETREPENPSLHLKKIIVVSRLVC
GSHQVILGLVCSFIERTFMATPSYVHVATELG YLFILKNQVKEALLWYSEAMKLDKDGMAGLTGII
LCHILEGHLEEAERYLEFLKEVQKSLGKSEVRAPWGYGLLQDDVLCCPPTPTFQCKVAWTFTLPLP
TKSAQADIGTETRSSLPQVLIFLQALLMSRKHKGEEETTALLKEAVELHFSSMQGIPLGSEYFEKLD
PYFLVCIKEYLLFCPKQPRLPQIVSPLLKQVAVILNPVVKAAPALIDPLYLMAQVRYYSGELEN
AQSIQRCELEDPASVDAHLLMCQIYLAQGNFGMCFHCLELGVSHNFQVVRDHPLYHLIKARALN
KAGDYPEAIKTLKMKVIKLPALKKEEGRKFLRPSVQPSQRASILLELVEALRLNGELHEATKVMQDT
INEFGGTPEENRITIANVDLVLSKGNVDVALNMLRNILPKQSCYMEAREKMANIYLQTLRDRRLYI
RCYELCEHLPGPHTSLLLGDALMSILEVSEPHSLAKWPPSLPSPVGEKRRKTQRHFPHQPEKALEV
YDEAYRNPHDASLASRIGHAYVKAHQYTKAIEYYEAAQKINGQDFLCCDLGKLLLKLKKVNKA
EKVLKQALEHDIGVQDIPSMNDVKCLLLAKVYKSHKKEAVIETLNKVIDRWTQALALDLQSRI
LKRVPLEQPEMIPSQKQLAASICIQFAEHYLAKEYDKAVQSYKDVFSYLPDKNKVLMAIDLMFRK
QKHEAANLYHQVLEKAPGDNFLVLHKLIDLLRRSGKLEDIPAFFELAKKVSSRVPLEPGFNCRGI
YCWHIGQPNEALKFLNKARKDSTWGQSAIYHVMVQICLNPDNEVVGGGEAFENLIPRSNTCSYMEKK
ELEQQGVSTA EKLLREFYPHSDSSQTQLRLLQGLCRLATREKANMEAAALGSFIQIAQAEKDSVPAL
LALAQA YVFLKQIPKARMQLKRLAKTPWVLSEAEDLEKSWLLLADIYCQGSKFDLAELELLRRCVQ
YNKAQSCYKAYEYMGFIMEKEQSYKDAVTNYKLAWKYSHHANPAIGKATSQGARETWEGGGQ
EPHHDPRQTGLYPG CYENQRGSQVTRVPPSLLSMSPVGFKLAFNYLKDKKFVEAIEICNDVSQQP
WWGGPGVVVG NPA (SEQ ID NO: 38)

FIG. 14C

>Hs_IFT139-2 ref|NT_005239.3|Hs2_5396 Homo sapiens chromosome 2
INYYCQERYFHHVLLVASEGIKRYGSDPVFRFYHAYGTLMEGKTQEALREFEAIKKNQDVSLCSLL
ALIYAHKDREAI LESDARVKEQRKGAGEKALYHAGLFLWHIGRHDKAREYIDRMIKISDGSKQGH
VLKAWLDITRGKEPYTKKALKYFEEGLQDGNDTFALLGKVSWRQNYSGALETVNQIIVNFP SFLP
AFVKKMKLQLALQDWDQTVETAQRLSNKIIFSF CGRSQ LILQKIQTLLERAFSLNPQQSEFATELG
YQMIQGRVKEALKWYKTAM TLDETSVSALVGFIQCQLIEGQLQDADQQL EFLNEIQSIGKSAV
LIYLHAVLAMKKNK RQEEVINLLNDVLDTHFSQLEGLPLGIQYFEKLNPD FLEIVMEYLSFCPMQ
VSNYGFLLDIEAAFN NLQHCLEHNPSYADAHLLLAQVYLSQEKVKLC SLSLELCLSYDFKVQVR
DYPLYHLIKAQS QKKMGEIADA IKTLMAMSLPGMKRIGASTKSKDRKTEVD TSHRLSIFLELIDV
HRLNGEHEATKVLQDAIHEFSGTSEEVRVTIANADLALA QGDIERALSILQNVTA EQPYFIEAREK
MADIY LKHRKDKMLYITCFAITYYEAA LKTGQKNYLCYDLAELL LKLKWDKAEKVLQHALAH
EPGMKARELQARVLKRVQMEQPDAVPAQKHLAAEICA EIAKHSVAQRDYEKA IKFYREALVHCE
TDNKNVDNYMTLSRLIDLLRRCGKLEDVPRFFSMAEKRNSRAKLEPGFQYCKGLYLWYTGE PNDA
LRHFNKARKDRDWGQNALY NMIEICLNP DNETVGGEVFENLDGDSNSTE KQESVQLAVRTAEKL
LKEKLPQTVQGHVQLRIMENYCLMATKQKSNEQALNTFTEIA ASEKEHIPALLGMATAYMILKQ
TPRARNQLKRIAKMNWNAIDAEFEKSWLLLADIYIQSAKYDMAEDLLKRC LRHNRSCCKAYEY
MGYIMEKEQAYTDAALNYEMAWKYSNRTPAVG (SEQ ID NO: 39)

FIG. 14D

Caenorhabditis elegans

>gi|7511091|pir||T29012 hypothetical protein ZK328.7 - *Caenorhabditis elegans*

MKVAANELAISTIHFLPGHIEKAKASIMMKDWRGVMDCIMNADQPEGSNPYIEVLRTVHGICYAG
EVSMLKRTLQLLKSLDENEATNHVLYARITKLLVVISGRDEKILRHARDFLTRALKISRKPDYVAL
SMRIAFGLGGAKEVSTLSQELVALDCEDSYAVLSSVVSMLMISRVSDARAQFDILPSAHPKLLESPL
YYLIASVLAKQSKDKSFENFRQHIEENLVEMLRNQLQSFPFGLDYLSLFSSDLLYSAVEQCDFDYPLV
PIKAPDDCMKLTAKTLQMIYDVAPGLAHCTLQLARNSYLCSNTNAAEKWIEKVLDKDDSLADAHI
LRAELILDRGGKITDADDALVTGLNFNFKLRETSLYHLIKSKTFKKRNENDEAIKTLKMALQIPRKE
PSKNLFQPKESADTHKISVQLELIDTLQHMKRIQEAETMTDALAEWAGQPEQDQLVIAQAQLYL
TKGHVERALGILKKIQPGQSNFHLRSIKMAEIYLEEKKDKRMFAACYRELLKVEATPGSYSLGDA
FMKVQEPEDAINFYEQALKMQSKDVQLAEKIGEAYVMAHLYSKAVNFYESSMNIYKDKNMRLK
LANLLLKLRFKCEKVLRAFFERDPEPVGTTETIQTYIQFLLLLAECEHMDNVPEAMNDFEKAKS
LHSRIQDKTLTAALKKEGARICNLQAELLYRRREFSQAVDICKQALAYHETDLKANLLLSKIFKEE
NKWTLVLQPCQTVIQVDPHNDEANSILADFYIRSEAAHASTSYTTLNTPQHWHALSRVVELF
CRNGEQNAAEKHLDRAKEVNPVCVTESGYNVCRGRFEWYTGQNEALRYYSRTKDSAAGWREK
ALYYMIDICLNPDNEIHIDENSVENPETTKIYLVSELWKKLVNSKNLPNITSYSENQSTDRFLAQ
NFIRMHTTDKSAIQAAALDEFNRMAFNADRSQVTNVGAVFGVARGHVLLKQVQKAKTVLKMVNG
RVWNFDDSDYLEKCWLMLADIYINQNKNDQAVTFLDLVFKYNCNCLKAFELYGYMREKEQKYV
EAYKMYEKAFMATKERNPGFGYKLAFTYLKAKRLFACIETCQKVLDLNPQYPKIKKEIMDKAKA
LIRT (SEQ ID NO: 40)

FIG. 14E

Che-2

Chlamydomonas

>Cr_Che-2 predicted peptide sequence

MRLKVKQSSANVHSELTAAVGWNVWNEFLTCSDDQTIHKWNMLGEPEQKVSTLDAYFTDMHW
YPVSSKKTQAGGTDVFAVACTDGSVKILSRTGRVEKSIEGHKGACISLRWSYDGTALATAGEDGS
VKIWSRNGMLRSTLAQADSPVYSIVWAYDCDQLCYCTGSNVVIKSLSSNAKQNAWKAHDGVVL
KVDWSPINHLITGGEDCKYKVDWSFGRLLFQSGLFDPVTSVAWAPSGELFAVGGFNTLQLCDR
MGWAYSKIHLNDTGSIMTLSWTADSTQLAGGGGSGGVVFGQVVDLALEDGKMQVTVVDDMRIV
VNDILNENADELPEFRDRVIKVS LGYGYLIVATATQCHVYNTTNLGT PHIFDLKDTV TLLLQAERH
FLLDNSAGIQIYTYEGRQICNPRFQGLRTELLNAQMITLSNDTIAVLDQQASGTTVRFFDTAQGRP
VGEPWQHTLEVKEIALSQAGTINDRQLIVIDRNRDLYLLPVMKRHVAKLAAMCDSARWHDSTAM
LSAMVDQRLCVWYYPSEVYVDKDLLAKTRYTKSDSDFGKSAQIQLFAGNRCLVRRSDGVLVSAA
TSPYPAVL YDMIRKQQWDKATRLCRFIKDPTMWATLAAMAMAAKELNTAEVAFAAIDEVDKTH
FVRKVKQIPTEEGRNAELAVYRRKPEEGESILLQAGLVFRAIKLNIKLFNWERALXLATQHKQHQD
TVLWYRQQFLKNAKLAESITRFMQMNESVVVDQAAVKKKIEEERIKESQRPGAKRYV

(SEQ ID NO: 22)

FIG. 15A

>Cr_Che-2 cDNA sequence

ATGCGTCTCAAGGTCAAGCAGTCCAGCGCGAATGTGCACAGCGAATTAACAGCAGCTGTGGG
CTGGAATGTCTGGAATGAACTGTTCACTTGTAGCGACGACCAGACTATTACAAATGGAACAT
GCTGGGGGAGCCAGAGCAGAAGGTCAGCACTCTGGACGCATACTTCACGGATATGCACTGGT
ACCCCGTGAGCTCGAAGAAGACGCAAGCAGGCGGACGGACGTATTGCGGGTGGCGTGCACA
GACGGCTCTGTAAAAATCCTCAGCCGCACGGGCCGCTGGAGAAGTCCATTGAGGGGCACAA
GGGCGCGTGCATCTCGCTGCGCTGGAGCTATGACGGGACGGCACTGGCGACGGCGGGCGAGG
ACGGGTCGGTAAAGATCTGGTTCGCGCAACGGCATGCTGCGCTCCACGCTAGCGCAGGCGGAC
AGCCCCGTGTA CTGATTGTGTGGGCCTACGACTGCGACCAGCTGTGCTACTGCACCGGCTCC
AACGTGGTCATCAAGTCGCTGTCTCCAACGCCAAGCAGAACGCGTGGAAGGCGCACGACGG
CGTGGTGCTCAAGGTGGACTGGAGCCCCATCAACCACCTCATCATCACAGGCGGGCAGGACT
GCAAGTACAAGGTGTGGGACAGCTTTGGGCGGCTGCTGTTCCAGAGCGGGCTGTTGACTACC
CGGTACGTCGGTGGCGTGGGCGCCCAGCGGCGAGCTGTTGCGGGTGGGCGGCTTCAACACG
CTGCAGCTGTGTGACCGCATGGGCTGGGCCTACTCCAAGATCCACCTCAACGACACGGGCAGC
ATCATGACTCTGAGCTGGACGGCGGACAGCACGCAGCTGGCGGGCGGCGGCGGCGGCGGCGG
CGTGGTGTTGCGCCAGGTGGTGGACCTGGCGCTGGAGGACGGCAAGATGCAGGTGACGGTGG
TGGACGACATGCGCATTGTGGTGAACGACATCTTGAACGAGAACGCGGACGAGCTGCCCAG
TTCCGTGACCGCGTCATCAAGGTGTCGCTAGGGTACGGCTACCTGATCGTGGCCACCGCGACG
CAGTGCCACGTGTACAACACCACCAACCTGGGACGCGCGCACATCTTGACCTCAAAGACACG
GTCACCTGCTGCTGCAGGCTGAGCGGCACTTCCTGCTGCTGGACAACTCGGCGGGCATCCAG
ATCTACACCTACGAGGGCCGCCAGATCTGCAACCCGCGCTTCCAGGGCCTGCGCACCGAGCTG
CTGAACGCGCAGATGATCACGCTGTCCAACGACACGATAGCGGTGCTGGACCAGCAGGCCAG
CGGCACCACCGTGCGCTTCTTCGACACGGCGCAGGGCCGGCCAGTGGGCGAGCCGTGGCAGC
ACACGTTGGAGGTGAAGGAGATCGCGCTGAGCCAGGCCGGCACCATCAACGACCGCCAGCTC
ATCGTCATCGACCGCAACCGCGACCTGTACCTGCTGCCGTCATGAAGCGCCACGTGGCCAAG
CTGGCGGCCATGTGCGACTCGGCGCGCTGGCACGACAGCACCGCCATGCTGTCCGCCATGGTG
GACCAGCGCTGTGTGTGTGGTACTACCCAGCGAGGTGTACGTGGACAAGGACCTGCTGGCC
AAGACGCGCTACACCAAGTCCGACTCGGACTTTGGCAAGTCGGCCCAGATCCAGCTCTTCGCC
GGCAACCGCTGCCTGGTGCGCCGCTCCGACGGCGTGGTCTCCGCCGCCACCTCGCCCTAC
CCTGCCGTACTGTACGACATGATCCGCAAGCAGCAGTGGGACAAGGCCACGCGGCTGTGTCTG
CTTCATCAAGGACCCCAACCATGTGGGCCACGCTGGCGGCGATGGCCATGGCGGCTAAGGAGC
TGAACACGGCGGAGGTGGCGTTCGCGGCGATTGACGAGGTGGACAAAACGCACTTTGTGCGC
AAGGTGAAGCAGATCCCCACGGAGGAGGGCCGCAACGCCGAGCTGGCGGTGTACCGGCGCA
AGCCCGAGGAGGGCGAGTCCATACTGCTGCAGGCCGGCCTGGTCTTCGCGGCCATCAAGCTG
AACATCAAGCTGTTCAACTGGGAGCGCGCTGSACCTGGCCACGCAGCACAAGCAGCACCA
GGACACGGTGCTGTGGTACCGCCAGCAGTTCCTCAAGAACGCCAAGCTCGCCGAGTCCATCAC
GCGCTTCATGCAGATGAACGAGTCGGTGGTGTGGACCAGGCGGCGGTGAAGAAGAAGATCG
AGGAGGAGCGCATCAAGGAGTCGACGCGGCCAGGCGCCAAGCGCTACGTGTAA

(SEQ ID NO: 21)

FIG. 15B

Human

>Hs_Che-2 gi|7243129|dbj|BAA92612.1| KIAA1374 protein [Homo sapiens]
IELVSCVGVWTTAEELYSCSDDHQIVKWNLITSETTQIVKLPDDIYPIDFHWFPKSLGVKKQTQAESF
VLTSSDGKFLISKLGKVEKSVEAHCGAVLAGRWNYEGTALVTVGEDGQIKIWSKTGMLRSTLA
QQGTPVYSVAWGPDPSEKVLITAGKQLIKPLQPNKVLQWKAHDGILKVDWNSVNDLILSAGED
CKYKVVWDSYGRPLYNQPEHPITSVAWAPDGELFVGSFHTLRLCDKTGWSYALEKPNTGSIFN
IAWSIDGTQIAGACGNHVVFAHVVEQHWKWFQVTLTKRRAMQVRNVLNDVLDLLEFRDRV
IKASLNYAHLVVSTSLQCYVFSTKNWNTPIIFDLKEGTVSLILQAERHFLLVDGSSIIYLYSYEGRFIS
SPKFPGMRTDILNAQTVSLNDTIAIRDKADEKIIFLFEASTGKPLGDGKFLSHKNEILEIALDQKGL
TNDRKIAFIDKNRDLCTSVKRFKGEEQIIKLGTMVHTLAWNDTCNLCGLQDTRFIVWYYPNTVY
VDRDILPKTLYERDASEFSKNPHIVSFVGNQVTIRRADGSLVHISITPYPAILHEYVSSSKWEDAVRL
CRFVKEQTMWACLAAMAVANRDMTTAEIAYAAIGEIDKVQYINSIKNLPSKESKMAHILLFSGNI
QEAEIVLLQAGLVYQAIQININLYNWERALELAVKYKTHVDTVLAYRQKFLETFGKQETNKRYLH
YAEGLQIDWEKIKAKIEMEITKEREQSSSSQSSKSIGLKP (SEQ ID NO: 41)

FIG. 15C

Caenorhabditis elegans

>Ce_Che-2 gi|4468141|emb|CAB38019.1| CHE-2 protein [Caenorhabditis elegans]
MKLKLSASRKTRHTEMVCGVGVIGTEAILSADDHVLLTNTATNESQQILNMPETFFPTSLHIFP
RSQTKGGQNDVFAVSTSDGKINILSRNGKVENMVDANGAALCARWNSDGTGLLSSGEDGFVK
MWSRSGMLRSVLAQFATAVYCVAWDSTSSNVLYCNADHCYIKSLKMQVAPIKWKAHDGILCCD
WNPTSDLIVTGGEDLKFKVWDGFGQILFNSSVHDYPITSISWNTDGTLFVVGSHNLRRLCDKSGWS
HSLEKMNAGSVMALSWSPDGTQLAVGTAAGLVFHAHIIDKRLTYEEFEIVQTQKTVEVRDVSSE
VSRETLETKERISKIAILYKYLIVVTSSHIYSSKNWNTPTMIEYNERTVNIIVQCEKIFLVSDGMTIT
IFTYEGRKLINLNPQGVMALLDERKIDLANDTLVVRDRADNKVLHFFDPTTGKAQGDGNLKHEH
DIVELTVNQCGPLNDRNVAFRDQIGAVHIAMVKTFGVSRMVKIGSLVEQLVFNDVTNMLCGISE
GKIAVWPLPNVAFHNRNLLQKSLIQKNIGSVGKFPQLANFAGNTIVIRKSDGCLLPTGILPFYGTLLT
MASQSKWDQAIRLCRSIGNDTMWATFAGLAVLHKNMIVMEIAYAALEDDEKVSLINEIKDKTDK
ETRQAMQVVLTGKLADADVLLERSGLSFRSLMLNIQMFKWKRALELGLKNKQWLEIVMGYREK
YLKNCGQKETDPLFLKHMSEVEIDWVHIRELIAAEKAKGNN (SEQ ID NO: 42)

FIG. 15D